JOURNAL

OF

BACTERIOLOGY

VOLUME 109

BALTIMORE, MD. 21202

1972

JOURNAL OF BACTERIOLOGY

VOLUME 109

EDITORIAL BOARD

L. LEON CAMPBELL, Editor-in-Chief (1975)
University of Illinois, Urbana

R. L. ANDERSON, Editor (1975)
Michigan State University, East Lansing

ROY CURTISS III, Editor (1974)
The University of Tennessee, Oak Ridge

S. G. BRADLEY, Editor (1974)
Virginia Commonwealth University, Richmond

ALLEN G. MARR, Editor (1973)
University of California, Davis

H. E. UMBARGER, Editor (1976)
Purdue University, Lafayette, Ind.

Martin Alexander (1972)
W. Lane Barksdale (1972)
M. E. Bayer (1972)
Claire M. Berg (1973)
Robert W. Bernlohr (1973)
Allan Campbell (1972)
A. J. Clark (1972)
Royston C. Clowes (1972)
V. W. Cochrane (1972)
Stanley N. Cohen (1973)
S. F. Conti (1972)
A. L. Demain (1972)
John A. DeMoss (1972)
Walter J. Dobrogosz (1973)
Martin Dworkin (1973)
Alan D. Elbein (1973)
Herman Friedman (1972)
A. T. Ganesan (1972)
Howard Goldfine (1972)
Joseph S. Gots (1972)
Harlyn O. Halvorson (1972)
F. M. Harold (1973)
Leonard Hayflick (1972)
George Hegeman (1974)
Charles E. Helmstetter (1972)
Joseph T. Holden (1972)
John G. Holt (1972)
Stanley C. Holt (1974)
John Ingraham (1973)
Sam Kaplan (1974)
Hillel S. Levinson (1972)
W. R. Lockhart (1972)
Manley Mandel (1972)
Paul Margolin (1972)
Alvin Markovitz (1973)
M. L. Morse (1972)
Richard P. Novick (1973)
Leo Parks (1973)
H. J. Phaff (1972)
Allen T. Phillips (1973)
Jack Preiss (1974)
Charles C. Remsen III (1973)
William S. Reznikoff (1973)
H. V. Rickenberg (1973)
Antonio H. Romano (1973)
Harold L. Sadoff (1974)
M. R. J. Salton (1972)
Moselio Schaechter (1973)
David Schlessinger (1974)
Simon Silver (1973)
W. R. Sistrom (1972)
Lucile Smith (1972)
Bernard S. Strauss (1972)
Noboru Sueoka (1972)
Paul S. Sypherd (1974)
A. L. Taylor (1974)
Arthur Weissbach (1974)
N. E. Welker (1973)
R. W. Wheat (1972)
Helen R. Whiteley (1972)
Meyer J. Wolin (1973)
Frank E. Young (1973)
Stanley A. Zahler (1974)

ROBERT A. DAY, *Managing Editor, 1913 I St., N.W., Washington, D.C. 20006*

EX OFFICIO

MORRIS F. SHAFFER, President (1971–1972)
DONALD E. SHAY, Secretary

R. G. E. MURRAY, Vice-President (1971–1972)
T. J. CARSKI, Treasurer

The *Journal of Bacteriology*, a publication of the American Society for Microbiology, 1913 I St., N.W., Washington, D.C. 20006, is devoted to the advancement and dissemination of fundamental knowledge concerning bacteria and other microorganisms. The *Journal* is published monthly, and the twelve numbers are divided into four volumes per year. The subscription price is $52 (Postal Union Countries, $54; other foreign, $55) per year. Single copies are $5.00 (foreign, 5.25). Members of the American Society for Microbiology may receive the *Journal* as part of their dues. Correspondence relating to reprints, defective copies, availability of back issues, lost or late proofs, disposition of submitted manuscripts, and general editorial matters should be directed to the ASM Publications Office, 1913 I St., N.W., Washington, D.C. 20006. Correspondence from members relating to membership dues, member subscriptions, changes of address, incorrect journals, etc., should be directed to the Executive Secretary, American Society for Microbiology, 1913 I St., N.W., Washington, D.C. 20006. Nonmembers of the Society should write to The Williams & Wilkins Co., 428 E. Preston St., Baltimore, Md. 21202, regarding institution of nonmember subscriptions and nonreceipt of journals. Published monthly by the ASM at 428 E. Preston St., Baltimore, Md. 21202.

Second class postage paid at Baltimore, Md. 21202, and at additional mailing offices.

Made in the United States of America.

Copyright © 1972, American Society for Microbiology
All Rights Reserved.

Taxonomy and Ecology

Molecular Heterogeneity of the Bdellovibrios: Evidence of Two New Species. RAMON J. SEIDLER, M. MANDEL, AND J. N. BAPTIST 209
Nonidentity of *Bdellovibrio bacteriovorus* Strains 109D and 109J. SYDNEY C. RITTENBERG 432
Deoxyribonucleic Acid Homologies of Some So-Called "*Hydrogenomonas*" Species. ERICKA RALSTON, N. J. PALLERONI, AND M. DOUDOROFF 465

Morphology and Ultrastructure

Some Properties of Two Autolytic-Defective Mutants of *Streptococcus faecalis* ATCC 9790. H. M. POOLEY, G. D. SHOCKMAN, M. L. HIGGINS, AND J. PORRES-JUAN 423

Genetics and Molecular Biology

Genetic and Physiological Control of Serine and Glycine Biosynthesis in *Saccharomyces*. RODNEY ULANE AND MAURICE OGUR 34
Regulation of Penicillinase Synthesis: a Mutation on *Staphylococcus aureus* Unlinked to the Penicillinase Plasmid That Reduces Penicillinase Inducibility. J. WEAVER ZYSKIND AND JOHN IMSANDE 116
Regulation of Staphylococcal Penicillinase Synthesis. JOHN IMSANDE, JUDITH W. ZYSKIND, AND IMRE MILE 122
Mutants of *Escherichia coli* K-12 Blocked in the Final Reaction of Ubiquinone Biosynthesis: Characterization and Genetic Analysis. P. STROOBANT, I. G. YOUNG, AND F. GIBSON 134
Novel Mutation Causing Derepression of Several Enzymes of Sulfur Metabolism in *Neurospora crassa*. EARL G. BURTON AND ROBERT L. METZENBERG 140
Regulation of Orotidylic Acid Pyrophosphorylase in *Saccharomyces cerevisiae*. R. JUND AND F. LACROUTE 196
Ureidosuccinic Acid Uptake in Yeast and Some Aspects of Its Regulation. ROBERT DRILLIEN AND FRANÇOIS LACROUTE 203
Ribosome Synthesis in Thermally Shocked Cells of *Staphylococcus aureus*. LEONARD J. ROSENTHAL, SCOTT E. MARTIN, MICHAEL W. PARIZA, AND JOHN J. IANDOLO 243
Deoxyribonucleic Acid Degradation and the Lethal Effect by Myxin in *Escherichia coli*. R. M. BEHKI AND S. M. LESLEY 250
Loss of the Penicillinase Plasmid After Treatment of *Staphylococcus aureus* with Sodium Dodecyl Sulfate. STEPHEN A. SONSTEIN AND J. N. BALDWIN 262
Events Occurring Near the Time of Synapsis During Transformation in *Diplococcus pneumoniae*. CAROLYN J. COLLINS AND WALTER R. GUILD 266
Biosynthesis of 50*S* Ribosomal Proteins During the Outgrowth of *Bacillus subtilis* Spores. MARLENE V. SHAW AND ROBERT L. ARMSTRONG 276
Transfection of *Staphylococcus aureus* with Bacteriophage Deoxyribonucleic Acid. JAN-ERIC SJÖSTRÖM, MARTIN LINDBERG, AND LENNART PHILIPSON 285
Competence Mutants. II. Physical and Biological Fate of Donor Transforming Deoxyribonucleic Acid. EDITH HORN POSTEL AND SOL H. GOODGAL 292
Competence Mutants. III. Responses to Radiations. EDITH HORN POSTEL AND SOL H. GOODGAL 298
Unusual Valyl-Transfer Ribonucleic Acid Synthetase Mutant of *Escherichia coli*. JAMES J. ANDERSON AND FREDERICK C. NEIDHARDT 307
Growth-Linked Instability of a Mutant Valyl-Transfer Ribonucleic Acid Synthetase in *Escherichia coli*. JAMES J. ANDERSON AND FREDERICK C. NEIDHARDT 315
Murein Synthesis and Identification of Cell Wall Precursors of Temperature-Sensitive Lysis Mutants of *Escherichia coli*. E. J. J. LUGTENBERG, LIESBETH DE HAAS-MENGER, AND W. H. M. RUYTERS 326
Positive and Negative Control of R-Factor Replication in *Proteus mirabilis*. J. D. PUNCH AND D. J. KOPECKO 336
Method for Isolating Mutants Overproducing Nicotinamide Adenine Dinucleotide and Its Precursors. BERNARD WITHOLT 350

Gene Frequency Analysis of Chromosomal Initiation Sites in *Bacillus subtilis* After Ultraviolet Light or X-Ray Exposure. DANIEL BILLEN, GARY HELLERMAN, AND LAURA CARREIRA 379
Naturally Occurring R Factor, Derepressed for Pilus Synthesis, Belonging to the Same Compatibility Group as the Sex Factor F of *Escherichia coli* K-12. SHEENA DENNISON 416
Deoxyribonucleic Acid of *Anaplasma marginale*. D. SENITZER, G. T. DIMOPOULLOS, B. R. BRINKLEY, AND M. MANDEL 434
Genetic Behavior of R Factors in *Vibrio cholerae*. TAKESHI YOKOTA, TOKUHIKO KASUGA, MICHIHARU KANEKO, AND SHOGO KUWAHARA 440
Temperature Dependence of Sex-Factor Maintenance in *Escherichia coli* K-12. J. STADLER AND E. A. ADELBERG 447
Interaction of Maltose Transport with the Transport of Glucose and Galactosides. GRENETTA MCKINSTRY AND ARTHUR L. KOCH 455
Genetic and Biochemical Properties of Thymidine-Dependent Mutants of Pneumococcus. LINDA R. FRIEDMAN AND ARNOLD W. RAVIN 459

Physiology and Metabolism

New Type of R Factors Incapable of Inactivating Chloramphenicol. YUTAKA NAGAI AND SUSUMU MITSUHASHI 1
Regulation of the Methionine Feedback-Sensitive Enzyme in Mutants of *Salmonella typhimurium*. DAVID A. LAWRENCE 8
Purification and Characterization of Colicin D. K. TIMMIS 12
Nuclease Activities of *Mycoplasma gallisepticum* as a Function of Culture Age in Different Media. B. S. COWEN AND S. C. SMITH 21
Inorganic Nitrogen Assimilation in Yeasts: Alteration in Enzyme Activities Associated with Changes in Cultural Conditions and Growth Phase. KENNETH W. THOMULKA AND ALBERT G. MOAT 25
Function of Ubiquinone in *Escherichia coli*: a Mutant Strain Forming a Low Level of Ubiquinone. N. A. NEWTON, G. B. COX, AND F. GIBSON 69
Escherichia coli Tryptophanase in the Enteric Environment. JAMES L. BOTSFORD AND R. D. DEMOSS 74
Studies on the Diversity of Inositol-Containing Yeast Phospholipids: Incorporation of a 2-Deoxyglucose into Lipid. S. STEINER AND ROBERT L. LESTER 81
Nutritional Studies of *Rickettsia quintana*: Nature of the Hematin Requirement. WILLIAM F. MYERS, JOSEPH V. OSTERMAN, AND CHARLES L. WISSEMAN, JR. 89
Glucose Degradation, Molar Growth Yields, and Evidence for Oxidative Phosphorylation in *Streptococcus agalactiae*. M. N. MICKELSON 96
Induction and Regulation of Nicotinamide Adenine Dinucleotide-Specific 6-Phosphogluconate Dehydrogenase in *Streptococcus faecalis*. ALBERT T. BROWN AND CHARLES L. WITTENBERGER 106
Effects of Phenethyl Alcohol on Phospholipid Metabolism in *Escherichia coli*. WILLIAM D. NUNN AND BURTON E. TROPP 162
Further Studies on the Binding of Vitamin B_{12} to the Cell Wall of a B_{12}-Requiring *Lactobacillus*. TAKASHI SASAKI 169
Transport of Lycine and Hydroxylysine in *Streptococcus faecalis*. J. D. FRIEDE, D. P. GILBOE, K. C. TRIEBWASSER, AND L. M. HENDERSON 179
Fatty Acid Desaturase Mutants of Yeast: Growth Requirements and Electron Spin Resonance Spin-Label Distribution. BERNADINE J. WISNIESKI AND RICHARD K. KIYOMOTO 186
Role of the Cytoplasmic Membrane in the Synthesis of Ribonucleic Acid by Disrupted Spheroplasts of *Pseudomonas schuylkilliensis*. SHIGEKI MIZUNO AND BUNJI MARUO 218
Response of *Escherichia coli* B/r to High Concentrations of Sucrose in a Nutrient Medium. PAUL O. SCHEIE AND RITA REHBERG 229
Transmethylation of Sterols in Aerobically Adapting *Saccharomyces cerevisiae*. P. R. STARR AND L. W. PARKS 236

Significance of Altered Carbon Flow in Aromatic Amino Acid Synthesis: an Approach to the Isolation of Regulatory Mutants in *Pseudomonas aeruginosa*. DAVID H. CALHOUN AND ROY A. JENSEN 365
Mode of Cell Wall Growth of *Bacillus megaterium*. J. MAUCK, L. CHAN, L. GLASER, AND J. WILLIAMSON 373
Development of Respiration and Mitochondria in *Mucor genevensis* After Anaerobic Growth: Absence of Glucose Repression. G. D. CLARK-WALKER 399
Phenotype of a Temperature-Sensitive, Respiration-Deficient (*cyt*) Mutant of Yeast. SETUKO MIYAKE, YOSHIHISA IWAMOTO, MINAKO NAGAO, TAKASHI SUGIMURA, AND MASAKO OHSUMI 409
Effect of Temperature on the Fatty Acid Composition of the Extreme Thermophiles, *Bacillus caldolyticus* and *Bacillus caldotenax*. A. WEERKAMP AND W. HEINEN 443
Similarities Between *Hyphomicrobium* and *Nitrobacter* with Respect to Fatty Acids. THOMAS B. AURAN AND E. L. SCHMIDT 450
Nucleic Acid and Protein Synthesis During Thymineless Death in Lysogenic and Nonlysogenic Thymine Auxotrophs. GERALD MEDOFF 462
Effect of Membrane Lipid Composition on the Allosteric Inhibition by Sodium of the (Ca^{2+})-Adenosine Triphosphatase from *Escherichia coli*. RICARDO N. FARÍAS, LEONOR LONDERO, AND RAUL E. TRUCCO 471

Enzymology

Fermentation of Agmatine in *Streptococcus faecalis*: Occurrence of Putrescine Transcarbamoylase. ROBERT J. ROON AND H. A. BARKER 44
Chemical and Physical Characteristics of the Deoxycholate-Soluble and Magnesium-Reaggregated Membrane Nicotinamide Adenine Dinucleotide (Reduced Form) Oxidase of *Bacillus megaterium*. L. YU AND M. J. WOLIN 51
Separation of the Primary Dehydrogenase from the Cytochromes of the Nicotinamide Adenine Dinucleotide (Reduced Form) Oxidase of *Bacillus megaterium*. L. YU AND M. J. WOLIN 59
Formate Dehydrogenase from *Clostridium acidiurici*. JAMES J. KEARNEY AND RICHARD D. SAGERS 152
Purification and Characterization of Phosphoenolpyruvate Carboxylase from *Plasmodium berghei*. HUEY G. MCDANIEL AND PATRICK M. L. SIU 385
Release of the β-Galactosidase-Synthesizing System from Ultraviolet Catabolite Repression by Cyclic 3′,5′-Adenosine Monophosphate, Dark Repair, Photoreactivation, and Cold Treatment. P. A. SWENSON 391
Effect of Monovalent Cations on the Malic Enzyme from the Extreme Halophile, *Halobacterium cutirubrum*. JUAN JOSÉ CAZZULO AND MARÍA CRISTINA VIDAL 437
Amylolytic Isoenzymes of *Thermoactinomyces vulgaris*. MARTIN J. ALLEN AND PAUL A. HARTMAN 452
Enzymatic Basis for Differentiation of *Rhizobium* into Fast- and Slow-Growing Groups. G. MARTINEZ-DE DRETS AND A. ARIAS 467

Volume 109 **Number 2**

Contents for February

Taxonomy and Ecology

Peptidoglycan Composition and Taxonomy of Group D, E, and H Streptococci, and *Streptococcus mutans*. HUTTON D. SLADE AND WILLIAM C. SLAMP 691
Deoxyribonucleic Acid Relationships Among Marine Vibrios. ROBERT S. ANDERSON AND ERLING J. ORDAL 696
Methanobacterium thermoautotrophicus sp. n., an Anaerobic, Autotrophic, Extreme Thermophile. J. G. ZEIKUS AND R. S. WOLFE 707
Fatty Acid Composition of Unicellular Strains of Blue-Green Algae. C. N. KENYON 827

Morphology and Ultrastructure

Distribution of Lipids in the Wall and Cytoplasmic Membrane Subfractions of the Cell Envelope of *Escherichia coli*. DAVID A. WHITE, W. J. LENNARZ, AND CARL A. SCHNAITMAN 686
Ultrastructure of *Pseudomonas saccharophila* at Early and Late Log Phase of Growth. HO LEE YOUNG, FU-CHUAN CHAO, G. TURNBILL, AND D. E. PHILPOTT 862
Morphogenesis of Ascospores in *Saccharomyces cerevisiae*. E. GUTH, T. HASHIMOTO, AND S. F. CONTI 869
Isolation and Partial Chemical Characterization of the Spore Appendages of *Clostridium taeniosporum*. DIANE P. YOLTON, ROBIN N. HUETTEL, DIANNE K. SIMPSON, AND L. J. RODE 881
Isolation, Characterization, and Ultrastructure of the Peptidoglycan Layer of a Marine Pseudomonad. C. W. FORSBERG, M. KHALIL RAYMAN, J. W. COSTERTON, AND ROBERT A. MACLEOD 895
Temperature-Sensitive Mutant of *Bacillus subtilis* That Accumulates Membrane-Associated Protein Inclusions. R. J. BEHME AND P. C. FITZ-JAMES 906
Apical Vesicles in Growing Bud Cells of Heterobasidiomycetous Yeasts. E. KATHLEEN MCCULLY AND CHARLES E. BRACKER 922
Fine Structure of Ascosporogenesis in *Nematospora coryli* Peglion, a Pathogenic Yeast. SANTIAGO B. PLURAD 927
Fine Structure of *Haemophilus vaginalis*. B. SUE CRISWELL, WAYNE A. STENBACK, S. H. BLACK, AND HERMAN L. GARDNER 930
Disruption of a Multiple Transport Mutant of *Neurospora crassa* by KCl. G. TRAVIS, L. WOLFINBARGER, JR., W. DORSEY STUART, AND A. GIB DEBUSK 933
Shape of *Treponema pallidum*. C. D. COX 943

Genetics and Molecular Biology

Deoxyribonucleic Acid Damage by Monofunctional Mitomycins and Its Repair in *Escherichia coli*. NOZOMU OTSUJI AND ICHIKO MURAYAMA 475
Isolation of Temperature-Sensitive Mutants of *Schizosaccharomyces pombe*. STEFANIA BONATTI, MARCELLA SIMILI, AND ANGELO ABBONDANDOLO 484
Replication of the R Factor R*ts*1 in *Proteus mirabilis*. YOSHIRO TERAWAKI AND R. ROWND 492
Transport of *S*-Adenosylmethionine in *Saccharomyces cerevisiae*. J. T. MURPHY AND K. D. SPENCE 499
Role of Histidine Transfer Ribonucleic Acid in Regulation of Synthesis of Histidyl-Transfer Ribonucleic Acid Synthetase of *Salmonella typhimurium*. E. MCGINNIS AND L. S. WILLIAMS 505
Biochemistry and Genetics of Galactose Metabolism in Group H *Streptococcus* Strain Challis. GERALDINE H. LUGINBUHL AND HARRY GOODER 512
Leakage of Periplasmic Enzymes by Mutants of *Escherichia coli* and *Salmonella typhimurium*: Isolation of "Periplasmic Leaky" Mutants. J. LOPES, S. GOTTFRIED, AND L. ROTHFIELD 520
Isolating Tryptophan Regulatory Mutants in *Escherichia coli* by Using a *trp-lac* Fusion Strain. WILLIAM S. REZNIKOFF AND KATHLEEN PASTICK THORNTON 526
Analysis of a *Bacillus subtilis* Proteinase Mutant. RUTH SHOER AND HARRY P. RAPPAPORT 575
Leucyl-Transfer Ribonucleic Acid Synthetase from a Wild-Type and Temperature-Sensitive Mutant of *Salmonella typhimurium*. T. W. MIKULKA, B. I. STIENGLITZ, AND J. M. CALVO 584
Suppression of a Mutation Disruptive to Nuclear Migration in *Schizophyllum* by a Gene Linked to the *B* Incompatibility Factor. Y. KOLTIN AND JUDITH STAMBERG 594
Method for Restricting Incorporation of Radioactivity from ^{3}H-Thymidine into Deoxyribonucleic Acid Only During Outgrowth of Spores of *Bacillus cereus* T. RAJENDRA S. RANA AND HARLYN O. HALVORSON 599
Nature of Deoxyribonucleic Acid Synthesis and Its Relationship to Protein Synthesis During Outgrowth of *Bacillus cereus* T. RAJENDRA S. RANA AND HARLYN O. HALVORSON 606

Specific Effects of Heating of Transformable Streptococci on Their Ability to Discriminate Between Homospecific, Heterospecific, and Hybrid Deoxyribonucleic Acid. ARNOLD W. RAVIN AND MICHAEL MA ... 616
Control of Stable Ribonucleic Acid Chain Initiation in *Escherichia coli* During Diauxie Lag. LEWIS A. JACOBSON ... 678
Genophore Homologies Among Compatible Nocardiae. JOSEPHINE E. CLARK AND GEORGE H. BROWNELL ... 720
Ordering of Mutant Sites in the Isoleucine-Valine Genes of *Escherichia coli* by Use of Merogenotes Derived from F^{14}: a New Procedure for Fine-Structure Mapping. NANCY J. MARSH AND D. E. DUGGAN ... 730
Derivation of an F-Merogenote and a ϕ80 High-Frequency Transducing Phage Carrying the Histidine Operon of *Salmonella*. M. J. VOLL ... 741
Dependence of Ribonucleic Acid Synthesis on Continuous Protein Synthesis in Yeast. R. M. ROTH AND C. DAMPIER ... 773
Ribosomal Proteins Involved in the Suppression of Streptomycin Dependence in *Escherichia coli*. GERALD KREIDER AND BARBARA L. BROWNSTEIN ... 780
Genetic Control of Enzyme Induction in the β-Ketoadipate Pathway of *Pseudomonas putida*: Deletion Mapping of *cat* Mutations. M. L. WHEELIS AND L. N. ORNSTON ... 790
Genetic Control of Enzyme Induction in the β-Ketoadipate Pathway of *Pseudomonas putida*: Two-Point Crosses with a Regulatory Mutant Strain. C.-H. WU, M. K. ORNSTON, AND L. N. ORNSTON ... 796
Transformation of Chromosomal and Plasmid Characters in *Staphylococcus aureus*. MARTIN LINDBERG, JAN-ERIC SJÖSTRÖM, AND THOMAS JOHANSSON ... 844
Characterization of Insoluble Protein Fractions of Mitochondria from *Saccharomyces cerevisiae*. A. FIECHTER, F. A. MIAN, H. RIS, AND H. O. HALVORSON ... 855
Hydrostatic Pressure Effects on *Escherichia coli*: Site of Inhibition of Protein Synthesis. J. R. SCHWARZ AND J. V. LANDAU ... 945

Physiology and Metabolism

Occurrence of Taurine:α-Ketoglutarate Aminotransferase in Bacterial Extracts. SEIZEN TOYAMA AND KENJI SODA ... 533
Characteristics of S Organism Isolated from *Methanobacillus omelianskii*. C. ADINARAYANA REDDY, M. P. BRYANT, AND M. J. WOLIN ... 539
Requirement of Succinate for the Growth of *Vibrio succinogenes*. R. A. NIEDERMAN AND M. J. WOLIN ... 546
Germination of Heat- and Alkali-Altered Spores of *Clostridium perfringens* Type A by Lysozyme and an Initiation Protein. CHARLES L. DUNCAN, RONALD G. LABBE, AND ROBERT R. REICH ... 550
Identification of Competence-Repressing Factors During Log-Phase Growth of *Haemophilus influenzae*. DONALD H. MILLER AND P. C. HUANG ... 560
Lipids of a T Strain of *Mycoplasma*. NINO ROMANO, PAUL F. SMITH, AND WILLIAM R. MAYBERRY ... 565
Fermentation of Fructose and Synthesis of Acetate from Carbon Dioxide by *Clostridium formicoaceticum*. W. E. O'BRIEN AND LARS G. LJUNGDAHL ... 626
Total Synthesis of Acetate from CO_2. V. Determination by Mass Analysis of the Different Types of Acetate Formed from $^{13}CO_2$ by Heterotrophic Bacteria. MARVIN SCHULMAN, DONALD PARKER, LARS G. LJUNGDAHL, AND HARLAND G. WOOD ... 633
Effect of Temperature on the Integrity of *Bacillus psychrophilus* Cell Walls. STEPHEN J. MATTINGLY AND GARY K. BEST ... 645
Interaction of Concanavalin A with the Cell Wall of *Bacillus subtilis*. R. J. DOYLE AND D. C. BIRDSELL ... 652
Regulation of Secondary Metabolite Biosynthesis: Catabolite Repression of Phenoxazinone Synthase and Actinomycin Formation by Glucose. MARIA GALLO AND EDWARD KATZ ... 659
Effect of Glycerol Deprivation on the Phospholipid Metabolism of a Glycerol Auxotroph of *Staphylococcus aureus*. PAUL H. RAY AND DAVID C. WHITE ... 668
Alternate Pathway for Isoleucine Biosynthesis in *Escherichia coli*. A. T. PHILLIPS, J. I. NUSS, J. MOOSIC, AND C. FOSHAY ... 714

Role of Metabolic Energy in the Transport of β-Galactosides by *Streptococcus lactis*. E. R. KASHKET AND T. H. WILSON 784
Biosynthesis of Cardiolipin from Phosphatidylglycerol in *Staphylococcus aureus*. STEVEN A. SHORT AND DAVID C. WHITE 820
Utilization of γ-Aminobutyric Acid as the Sole Carbon and Nitrogen Source by *Escherichia coli* K-12 Mutants. SHABTAY DOVER AND YEHESKEL S. HALPERN 835
Chromosome Replication and Cell Division in *Escherichia coli* at Various Temperatures of Growth. O. PIERUCCI 848
Sporulation of Tricarboxylic Acid Cycle Mutants of *Bacillus subtilis*. ALLAN A. YOUSTEN AND RICHARD S. HANSON 886
New Obligate Methylotroph. JEAN STOKES DAHL, R. J. MEHTA, AND DEREK S. HOARE. 916
Biosynthesis of Thiamine Pyrophosphate in *Escherichia coli*. HIDEO NAKAYAMA AND RYOJI HAYASHI 936
Transport Alterations in a Phosphatidylethanolamine-Deficient Mutant of *Bacillus subtilis*. JAMES L. BEEBE 939

Enzymology

Halophilic Amylase from a Moderately Halophilic *Micrococcus*. HIROSHI ONISHI 570
3-Phosphoglycerate Kinase from *Hydrogenomonas facilis*. BRUCE A. MCFADDEN AND ERWIN SCHUSTER 751
Ferrous Ion-Dependent L-Serine Dehydratase from *Clostridium acidiurici*. JAMES E. CARTER AND RICHARD D. SAGERS 757
Characterization and Regulation of Pyruvate Carboxylase of *Bacillus licheniformis*. E. D. RENNER AND R. W. BERNLOHR 764
Localization and Solubilization of the Respiratory Nitrate Reductase of *Bacillus stearothermophilus*. DAVID F. KISZKISS AND R. J. DOWNEY 803
Physical Aggregation and Functional Reconstitution of Solubilized Membranes of *Bacillus stearothermophilus*. DAVID F. KISZKISS AND R. J. DOWNEY 811
p-Toluenethiol as an Initiator of Autolysis in Bakers' Yeast. WILFRED N. ARNOLD 949

Volume 109 **Contents for March** **Number 3**

Taxonomy and Ecology

Polynucleotide Sequence Divergence Among Strains of *Escherichia coli* and Closely Related Organisms. DON J. BRENNER, G. R. FANNING, F. J. SKERMAN, AND STANLEY FALKOW 953
Cell Wall Composition and Deoxyribonucleic Acid Similarities Among the Anaerobic Coryneforms, Classical Propionibacteria, and Strains of *Arachnia propionica*. J. L. JOHNSON AND C. S. CUMMINS 1047

Morphology and Ultrastructure

Chemical Analysis of and Degradation Studies on the Cell Wall Lipopolysaccharide of *Rhodopseudomonas capsulata*. J. WECKESSER, G. DREWS, AND I. FROMME 1106
Penicillin and Cell Wall Synthesis: a Study of *Bacillus cereus* by Electron Microscopy. PETER J. HIGHTON AND D. G. HOBBS 1181
Freeze-Etching of *Azotobacter vinelandii*: Examination of Wall, Exine, and Vesicles. GERALD D. CAGLE, G. R. VELA, AND ROBERT M. PFISTER 1191
Ultrastructure of Exosporium and Underlying Inclusions in Spores of *Bacillus megaterium* Strains. T. CABRERA BEAMAN, H. STUART PANKRATZ, AND PHILIPP GERHARDT 1198

Morphokinetic Reaction of *Streptococcus faecalis* (ATCC 9790) Cells to the Specific Inhibition of Macromolecular Synthesis: Nucleoid Condensation on the Inhibition of Protein Synthesis. LOLITA DANEO-MOORE AND MICHAEL L. HIGGINS..... 1210
Morphokinetic Reaction of Cells of *Streptococcus faecalis* (ATCC 9790) to Specific Inhibition of Macromolecular Synthesis: Dependence of Mesosome Growth on Deoxyribonucleic Acid Synthesis. MICHAEL L. HIGGINS AND LOLITA DANEO-MOORE..... 1221
Germination and Outgrowth of Single Spores of *Saccharomyces cerevisiae* Viewed by Scanning Electron and Phase-Contrast Microscopy. PAUL ROUSSEAU, HARLYN O. HALVORSON, LEE A. BULLA, JR., AND GRANT ST. JULIAN..... 1232
Effect of Proteolytic Enzymes on Bacterial Flagella. RAFAEL J. MARTINEZ, JOEL H. SHAPER, NANCY P. LUNDH, PATRICIA D. BERNARD, AND A. N. GLAZER..... 1239
Fixation of Mature Spores of *Clostridium botulinum*. KENNETH E. STEVENSON, REESE H. VAUGHN, AND ELI V. CRISAN..... 1295
Guanine Plus Cytosine Contents of the Deoxyribonucleic Acids of Some Sulfate-Reducing Bacteria: a Reassessment. G. W. SKYRING AND H. E. JONES..... 1298
Size Distribution of Bacterial Cells. V. R. STULL..... 1301

Genetics and Molecular Biology

Synthesis of Trachoma Agent Proteins in Emetine-Treated Cells. YECHIEL BECKER AND YAEL ASHER..... 966
Conditional Lethality of *recA* and *recB* Derivatives of a Strain of *Escherichia coli* K-12 with a Temperature-Sensitive Deoxyribonucleic Acid Polymerase I. M. MONK AND J. KINROSS..... 971
Repair of Pyrimidine Dimer Damage Induced in Yeast by Ultraviolet Light. MICHAEL A. RESNICK AND JANE K. SETLOW..... 979
Action of Haemophilus Endodeoxyribonuclease on Biologically Active Deoxyribonucleic Acid. ROSA GROMKOVA AND SOL H. GOODGAL..... 987
The pi-Histidine Factor of *Salmonella typhimurium*: a Demonstration that pi-Histidine Factor Integrates into the Chromosome. MARK LEVINTHAL AND JEN YEH..... 993
Comparison of Cysteine and Tryptophan Content of Insoluble Proteins Derived from Wild-Type and mi-1 Strains of *Neurospora crassa*. WENDELL D. ZOLLINGER AND DOW O. WOODWARD..... 1001
Effect of D-Cycloserine on Transformation in Group H Streptococcus, Strain Challis. DENNIS PERRY..... 1014
Regulation of Synthesis of Methionyl-, Prolyl-, and Threonyl-Transfer Ribonucleic Acid Synthetases of *Escherichia coli*. E. R. ARCHIBOLD AND L. S. WILLIAMS..... 1020
Inhibition of Gene Transfer by Antiserum and Identification of Serotypes of Sex Pili. VALERIE HARDEN AND ELINOR MEYNELL..... 1067
Structure and Replication of Chromosomes in Competent Cells of *Bacillus subtilis*. ROBERT J. ERICKSON AND JAMES C. COPELAND..... 1075
Isolation and Partial Characterization of Regulatory Mutants of the Pyrimidine Pathway in *Salmonella typhimurium*. GERARD A. O'DONOVAN AND JOHN C. GERHART..... 1085
Specific Role of Sex Pili in the Effective Eliminatory Action of Sodium Dodecyl Sulfate on Sex and Drug Resistance Factors in *Escherichia coli*. HARUYO ADACHI, MARIKO NAKANO, MANABU INUZUKA, AND MUNEMITSU TOMOEDA..... 1114
Close Linkage Between *Ochre* and Missense Suppressors in *Escherichia coli*. E. ORIAS, T. K. GARTNER, J. E. LANNAN, AND M. BETLACH..... 1125

Induction of Cycloheximide-Resistant Mutants in *Saccharomyces cerevisiae* with *N*-Methyl-*N'*-Nitro-*N*-Nitrosoguanidine and ICR-170. DAVID J. BRUSICK 1134
Uninducible Mutants in the *gal i* Locus of *Saccharomyces cerevisiae*. H. C. DOUGLAS AND D. C. HAWTHORNE 1139
Effect of Phenethyl Alcohol on Deoxyribonucleic Acid-Membrane Association in *Escherichia coli*. W. E. MASKER AND H. EBERLE 1170
Acid-Soluble Nucleotides in an Asporogenous Mutant of *Bacillus subtilis*. C. T. CHOW AND I. TAKAHASHI 1175
Ultrastructural Studies on a Mutant of *Bacillus subtilis* Whose Growth is Inhibited Due to Insufficient Autolysin Production. DAVID P. FAN, MARY M. BECKMAN, AND WILLIAM P. CUNNINGHAM 1247
New Centrifugation Technique for Isolating Enzymes from Large Cell Structures: Isolation and Characterization of Two *Bacillus subtilis* Autolysins. DAVID P. FAN AND MARY M. BECKMAN 1258
Structural Difference Between Walls from Ends and Sides of the Rod-Shaped Bacterium *Bacillus subtilis*. DAVID P. FAN, MARY C. PELVIT, AND WILLIAM P. CUNNINGHAM 1266
Osmotic-Sensitive Mutant of *Salmonella typhimurium*. DORA N. ANTÓN 1273
Requirement of Adenosine 3',5'-Cyclic Phosphate for Formation of the Phage Lambda Receptor in *Escherichia coli*. TAKESHI YOKOTA AND TOKUHIKO KASUGA 1304
Photoreactivation and Gene Dosage in Yeast. MICHAEL A. RESNICK AND JANE K. SETLOW 1307
Deoxyribonucleic Acid-Protein Ratio and Radioresistance in *Micrococcus radiodurans*. M. L. FREEDMAN AND A. K. BRUCE 1310
Recombination of *Escherichia coli* Chromosomal Segments in *Salmonella typhosa*. E. M. JOHNSON, J. A. ALEXEICHIK, AND L. S. BARON 1313

Physiology and Metabolism

Cell Cycle Dependency of Sporulation in *Saccharomyces cerevisiae*. JAMES E. HABER AND HARLYN O. HALVORSON 1027
Altered Phospholipid Metabolism in a Sodium-Sensitive Mutant of *Escherichia coli*. JOAN E. LUSK AND EUGENE P. KENNEDY 1034
Model for Branch Initiation in *Aspergillus nidulans* Based on Measurements of Growth Parameters. DVORAH KATZ, DINAH GOLDSTEIN, AND R. F. ROSENBERGER 1097
Inhibition and Activation of Bacterial Luciferase Synthesis. ANATOL EBERHARD 1101
Ribose Utilization by *Veillonella alcalescens*. DAVID KAFKEWITZ AND E. A. DELWICHE 1144
Growth of Obligate Autotrophic Bacteria on Glucose in a Continuous Flow-Through Apparatus. P. PAN AND W. W. UMBREIT 1149
"Compartmentalization" of *Escherichia coli* Ribosomes and Ribonucleic Acid. FREDERICK VARRICCHIO 1284
Synchronization of Cell Division in *Escherichia coli* by Elevated Temperatures: a Reinterpretation. RUTH LOMNITZER AND ELIORA Z. RON 1316
Ribosomal Proteins of *Rhodopseudomonas palustris*. Y. M. BHATNAGAR AND C. S. STACHOW 1319

Enzymology

Factors Affecting the Level of Alanine Racemase in *Escherichia coli*. MARY PULLIAM LAMBERT AND FRANCIS C. NEUHAUS 1156

Feedback Regulation of 3-Deoxy-D-*arabino*-Heptulosonate 7-Phosphate Synthetase from a Marine Bacterium, *Vibrio* MB22. ANDREW M. CHLUDZINSKI, DONALD S. SALTER, AND DELILL NASSER 1162
Characterization of Colicin Ia and Colicin Ib: Antigenic Homology. RICHARD E. ISAACSON AND JORDAN KONISKY 1322
Thermolabile Triose Phosphate Isomerase in a Psychrophilic *Clostridium*. YUEN WAN SHING, JAMES M. AKAGI, AND RICHARD H. HIMES 1325

INDEX TO DATE OF ISSUE

Month	Date of Issue	Pages
January	18 January 1972	1–474
February	10 February 1972	475–952
March	14 March 1972	953–1328

Methods for Numerical Taxonomy

W. R. Lockhart and John Liston, *Editors*

The wide application of numerical methods to the study of bacterial classification during recent years has resulted in an almost bewildering variety of new techniques. The authors have drawn from the literature and from their own experience in producing this useful volume which describes some frequently used experimental methods. Without dwelling too much on underlying theoretical and philosophical arguments, they offer practical advice that should help students and workers unfamiliar with this field to evaluate the published results of others, and to select techniques applicable to their own work. Though intended primarily for microbiologists, the book should prove useful to anyone interested in numerical approaches to classification.

This small but important volume (58 pages plus index, paperbound) was prepared by the Taxonomy Committee (Subcommittee on Numerical Taxonomy) of ASM. The book comprises the following chapters:

- Introduction (John Liston)
- Collecting the Data (R. R. Colwell)
- Coding the Data (W. R. Lockhart)
- Analyzing the Data (C. Quadling)
- Presenting and Interpreting the Results (E. F. Lessel and J. G. Holt)

Available at $3 per copy from:
Publications Office
American Society for Microbiology
4715 Cordell Ave.
Bethesda, Md. 20014

ANNOUNCING . . .

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY

a new monthly publication of the American Society for Microbiology

editors

Editor-in-Chief

Dr. Gladys L. Hobby, Scientific Director, Infectious Disease Research Institute, East Orange, New Jersey

Editors

Dr. Walter D. Celmer, Research Manager, Medical Research Laboratories, Pfizer Inc., Groton, Connecticut

Dr. Joel G. Flaks, Associate Professor of Biochemistry, University of Pennsylvania School of Medicine, Philadelphia

Dr. Edward W. Hook, Professor and Chairman, Department of Medicine, University of Virginia School of Medicine, Charlottesville, Virginia

Dr. Leon H. Schmidt, Associate Director of Chemotherapy Research, Southern Research Institute, Birmingham, Alabama

It is characteristic of the progress . . .

of science that new knowledge in a particular field of study fosters greater interest which, in turn, is followed by further discovery. This is the spiral of scientific progress and, sooner or later, the new information being acquired demands a regular medium for communication.

This has now happened with research in the field of antimicrobial agents and chemotherapy. Up until recently, the American Society for Microbiology's annual publication kept up with major activity in the field. But new advances in the area are now too numerous to be adequately presented only once a year. Consequently, beginning in January 1972, the Society will publish a monthly interdisciplinary journal devoted to the dissemination of knowledge relating to all aspects of antimicrobial agents and chemotherapy, including cancer chemotherapy.

PROPOSED SECTION HEADINGS

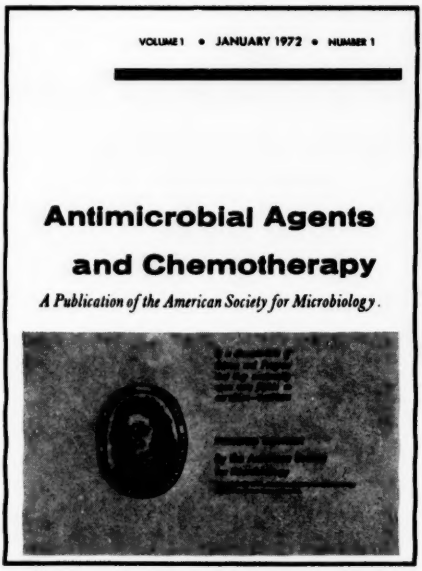
Chemistry

Biology and Experimental Infections

Mechanisms of Action and Resistance

Pharmacology

Clinical Efficacy


VOLUME 1 • JANUARY 1972 • NUMBER 1
Antimicrobial Agents and Chemotherapy
A Publication of the American Society for Microbiology

SUBSCRIPTION RATE:*
$40 per year (U.S.);
$41 per year (foreign).

For your subscription write:
Publications Office
American Society for Microbiology
1913 I St., N.W.
Washington, D.C. 20006

*** Members of ASM may receive the new journal as "part of their dues" and should subscribe when paying their annual dues.**

AUTHOR INDEX
VOLUME 109

Abbondandolo, Angelo, 484
Adachi, Haruyo, 1114
Adelberg, E. A., 447
Akagi, James M., 1325
Alexeichik, J. A., 1313
Allen, Martin J., 452
Anderson, James J., 307, 315
Anderson, Robert S., 696
Antón, Dora N., 1273
Archibold, E. R., 1020
Arias, A., 467
Armstrong, Robert L., 276
Arnold, Wilfred N., 949
Asher, Yael, 966
Auran, Thomas B., 450

Baldwin, J. N., 262
Baptist, J. N., 209
Barker, H. A., 44
Baron, L. S., 1313
Beaman, T. Cabrera, 1198
Becker, Yechiel, 966
Beckman, Mary M., 1247, 1258
Beebe, James L., 939
Behki, R. M., 250
Behme, R. J., 906
Bernard, Patricia D., 1239
Bernlohr, R. W., 764
Best, Gary K., 645
Betlach, M., 1125
Bhatnagar, Y. M., 1319
Billen, Daniel, 379
Birdsell, D. C., 652
Black, S. H., 930
Bonatti, Stefania, 484
Botsford, James L., 74
Bracker, Charles E., 922
Brenner, Don J., 953
Brinkley, B. R., 434
Brown, Albert T., 106
Brownell, George H., 720
Brownstein, Barbara L., 780
Bruce, A. K., 1310
Brusick, David J., 1134
Bryant, M. P., 539
Bulla, Lee A., Jr., 1232
Burton, Earl G., 140

Cagle, Gerald D., 1191
Calhoun, David H., 365
Calvo, J. M., 584
Carreira, Laura, 379
Carter, James E., 757
Cazzulo, Juan Jose, 437
Chan, L., 373
Chao, Fu-Chuan, 862
Chludzinski, Andrew M., 1162
Chow, C. T., 1175
Clark, Josephine E., 720
Clark-Walker, G. D., 399
Collins, Carolyn J., 266
Conti, S. F., 869
Copeland, James C., 1075
Costerton, J. W., 895
Cowen, B. S., 21
Cox, C. D., 943
Cox, G. B., 69
Crisan, Eli V., 1295
Criswell, B. Sue, 930
Cummins, C. S., 1047
Cunningham, William P., 1247, 1266

Dahl, Jean Stokes, 916
Dampier, C., 773
Daneo-Moore, Lolita, 1210, 1221
DeBusk, A. Gib, 933
de Haas-Menger, Liesbeth, 326
Delwiche, E. A., 1144
DeMoss, R. D., 74
Dennison, Sheena, 416
Dimopoullos, G. T., 434
Doudoroff, M., 465
Douglas, H. C., 1139
Dover, Shabtay, 835
Downey, R. J., 803, 811
Doyle, R. J., 652
Drews, G., 1106
Drillien, Robert, 203
Duggan, D. E., 730
Duncan, Charles L., 550

Eberhard, Anatol, 1101
Eberle, H., 1170
Erickson, Robert J., 1275

Falkow, Stanley, 953
Fan, David P., 1247, 1258, 1266
Fanning, G. R., 953
Farias, Ricardo N., 471
Fiechter, A., 855
Fitz-James, P. C., 906
Forsberg, C. W., 895
Foshay, C., 714
Freedman, M. L., 1310
Friede, J. D., 179
Friedman, Linda R., 459
Fromme, I., 1106

Gallo, Maria, 659
Gardner, Herman L., 930
Gartner, T. K., 1125
Gerhardt, Philipp, 1198
Gerhart, John C., 1085
Gibson, F., 69, 134
Gilboe, D. P., 179
Glaser, L., 373
Glazer, A. N., 1239
Goldstein, Dinah, 1097
Gooder, Harry, 512
Goodgal, Sol H., 292, 298, 987
Gottfried, S., 520
Gromkova, Rosa, 987
Guild, Walter R., 266
Guth, E., 869

Haber, James E., 1027
Halpern, Yeheskel S., 835
Halvorson, Harlyn O., 599, 606, 855, 1027, 1232
Hanson, Richard S., 886
Harden, Valerie, 1067
Hartman, Paul A., 452
Hashimoto, T., 869
Hawthorne, D. C., 1139
Hayashi, Ryoji, 936
Heinen, W., 443
Hellerman, Gary, 379
Henderson, L. M., 179
Higgins, Michael L., 423, 1210, 1221
Highton, Peter J., 1181
Himes, Richard H., 1325
Hoare, Derek S., 916
Hobbs, D. G., 1181
Huang, P. C., 560
Huettel, Robin N., 881

Iandolo, John J., 243
Imsande, John, 116, 122
Inuzuka, Manabu, 1114
Isaacson, Richard E., 1322
Iwamoto, Yoshihisa, 409

Jacobson, Lewis A., 678
Jensen, Roy A., 365
Johansson, Thomas, 844
Johnson, E. M., 1313
Johnson, J. L., 1047
Jones, H. E., 1298
Jund, R., 196

Kafkewitz, David, 1144
Kaneko, Michiharu, 440
Kashket, E. R., 784
Kasuga, Tokuhiko, 440, 1304
Katz, Dvorah, 1097
Katz, Edward, 659
Kearney, James J., 152
Kennedy, Eugene P., 1034
Kenyon, C. N., 827

Kinross, J., 971
Kiszkiss, David F., 803, 811
Kiyomoto, Richard K., 186
Koch, Arthur L., 455
Koltin, Y., 594
Konisky, Jordan, 1322
Kopecko, D. J., 336
Kreider, Gerald, 780
Kuwahara, Shogo, 440

Labbe, Ronald G., 550
Lacroute, François, 196, 203
Lambert, Mary Pulliam, 1156
Landau, J. V., 945
Lannan, J. E., 1125
Lawrence, David A., 8
Lennarz, W. J., 686
Lesley, S. M., 250
Lester, Robert L., 81
Levinthal, Mark, 993
Lindberg, Martin, 285, 844
Ljungdahl, Lars G., 626, 633
Lomnitzer, Ruth, 1316
Londero, Leonor, 471
Lopes, J., 520
Luginbuhl, Geraldine H., 512
Lugtenberg, E. J. J., 326
Lundh, Nancy P., 1239
Lusk, Joan E., 1034

Ma, Michael, 616
McCully, E. Kathleen, 922
McDaniel, Huey G., 385
McFadden, Bruce A., 751
McGinnis, E., 505
McKinstry, Grenetta, 455
MacLeod, Robert A., 895
Mandel, M., 209, 434
Marsh, Nancy J., 730
Martin, Scott E., 243
Martinez, Rafael J., 1239
Martínez-de Drets, G., 467
Maruo, Bunji, 218
Masker, W. E., 1170
Mattingly, Stephen J., 645
Mauck, J., 373
Mayberry, William R., 565
Medoff, Gerald, 462
Mehta, R. J., 916
Metzenberg, Robert L., 140
Meynell, Elinor, 1067
Mian, F. A., 855
Mickelson, M. N., 96
Mikulka, T. W., 584
Mile, Imre, 122
Miller, Donald H., 560
Mitsuhashi, Susumu, 1
Miyake, Setsuko, 409
Mizuno, Shigeki, 218
Moat, Albert G., 25
Monk, M., 971
Moosic, J., 714
Murayama, Ichiko, 475
Murphy, J. T., 499
Myers, William F., 89

Nagai, Yutaka, 1
Nagao, Minako, 409
Nakano, Mariko, 1114
Nakayama, Hideo, 936
Nasser, DeLill, 1162
Neiderman, R. A., 546
Neidhardt, Frederick C., 307, 315
Neuhaus, Francis C., 1156
Newton, N. A., 69
Nunn, William D., 162
Nuss, J. I., 714

O'Brien, W. E., 626
O'Donovan, Gerard A., 1085
Ogur, Maurice, 34
Ohsumi, Masako, 409
Onishi, Hiroshi, 570
Ordal, Erling J., 696
Orias, E., 1125
Ornston, L. N., 790, 796
Ornston, M. K., 796
Osterman, Joseph V., 89
Otsuji, Nozomu, 475

Palleroni, N. J., 465
Pan, P., 1149
Pankratz, H. Stuart, 1198
Pariza, Michael W., 243
Parker, Donald, 633
Parks, L. W., 236
Pelvit, Mary C., 1266
Perry, Dennis, 1014
Pfister, Robert M., 1191
Philipson, Lennart, 285
Phillips, A. T., 714
Philpott, D. E., 862
Pierucci, O., 848
Plurad, Santiago B., 927
Pooley, H. M., 423
Porres-Juan, J., 423
Postel, Edith H., 292, 298
Punch, J. D., 336

Ralston, Ericka, 465
Rana, Rajendra S., 599, 606
Rappaport, Harry P., 575
Ravin, Arnold W., 459, 616
Ray, Paul H., 668
Rayman, M. Khalil, 895
Reddy, C. Adinarayana, 539
Rehberg, Rita, 229
Reich, Robert R., 550
Renner, E. D., 764
Resnick, Michael A., 979, 1307
Reznikoff, William S., 526
Ris, H., 855
Rittenberg, Sydney C., 432
Rode, L. J., 881
Romano, Nino, 565
Ron, Eliora Z., 1316
Roon, Robert J., 44
Rosenberger, R. F., 1097
Rosenthal, Leonard J., 243
Roth, R. M., 773
Rothfield, L., 520
Rousseau, Paul, 1232
Rownd, R., 492
Ruyters, W. H. M., 326

Sagers, Richard D., 152, 757
St. Julian, Grant, 1232
Salter, Donald S., 1162
Sasaki, Takashi, 169
Scheie, Paul O., 229
Schmidt, E. L., 450
Schnaitman, Carl A., 686
Schulman, Marvin, 633
Schuster, Erwin, 751
Schwarz, J. R., 945
Seidler, Ramon J., 209
Senitzer, D., 434
Setlow, Jane K., 979, 1307
Shaper, Joel H., 1239
Shaw, Marlene V., 276
Shing, Yuen Wan, 1325
Shockman, G. D., 423
Shoer, Ruth, 575
Short, Steven A., 820
Simili, Marcella, 484
Simpson, Dianne K., 881
Siu, Patrick M. L., 385
Sjöström, Jan-Eric, 285, 844
Skerman, F. J., 953
Skyring, G. W., 1298
Slade, Hutton D., 691
Slamp, William C., 691
Smith, Paul F., 565
Smith, S. C., 21
Soda, Kenji, 533
Sonstein, Stephen A., 262
Spence, K. D., 499
Stachow, C. S., 1319
Stadler, J., 447
Stamberg, Judith, 594
Starr, P. R., 236
Steiner, S., 81
Stenback, Wayne A., 930
Stevenson, Kenneth E., 1295
Stieglitz, B. I., 584
Stroobant, P., 134
Stuart, W. Dorsey, 933
Stull, V. R., 1301
Sugimura, Takashi, 409
Swenson, P. A., 391

Takahashi, I., 1175
Terawaki, Yoshiro, 492
Thomulka, Kenneth W., 25
Thornton, Kathleen Pastick, 526
Timmis, K., 12
Tomoeda, Munemitsu, 1114

Toyama, Seizen, 533
Travis, G., 933
Triebwasser, K. C., 179
Tropp, Burton E., 162
Trucco, Raúl E., 471
Turnbill, C., 862

Ulane, Rodney, 34
Umbreit, W. W., 1149

Varricchio, Frederick, 1284
Vaughn, Reese H., 1295
Vela, G. R., 1191
Vidal, María Cristina, 437
Voll, M. J., 741

Weckesser, J., 1106
Weerkamp, A., 443
Wheelis, M. L., 790
White, David A., 686
White, David C., 668, 820
Williams, L. S., 505, 1020
Williamson, J., 373
Wilson, T. H., 754
Wisnieski, Bernadine J., 186
Wisseman, Charles L., Jr., 89
Witholt, Bernard, 350
Wittenberger, Charles L., 106
Wolfe, R. S., 707
Wolfinbarger, L., Jr., 933
Wolin, M. J., 51, 59, 539, 546
Wood, Harland G., 633
Woodward, Dow O., 1001
Wu, C.-H., 796

Yeh, Jen, 993
Yokota, Takeshi, 440, 1304
Yolton, Diane P., 881
Young, Ho Lee, 862
Young, I. G., 134
Yousten, Allan A., 886
Yu, L., 51, 59

Zeikus, J. G., 707
Zollinger, Wendell D., 1001
Zyskind, Judith W., 116, 122

SUBJECT INDEX
VOLUME 109

Acetate
—synthesis by *C. formicoaceticum*, 626, 633
Achromobacter superficialis
—taurine:α-ketoglutarate aminotransferase, 533
Aconitase
—mutants lacking, 886
Actinomycin
—catabolite repression by glucose, 659
Adenosine 3′,5′-cyclic phosphate
—role in phage lambda receptor formation, 1304
Adenosine triphosphatase
—allosteric inhibition of, 471
S-Adenosylmethionine
—transport of, 499
Agmatine
—growth of *S. faecalis* on, 44
—new enzyme for, 44
Alanine
—effect on alanine racemase levels, 1156
Alanine racemase
—repression and derepression of, 1156
γ-Aminobutyric acid
—metabolism of, 835
Ammonia
—enzymes for assimilation, 25
Amylase
—halophilic, 570
Amylase
—of *Thermoactinomyces vulgaris*, 452
Anaplasma marginale
—DNA of, 434
Arachnia propionica
—relation to propionibacteria and anaerobic coryneforms, 1047
Aromatic amino acids
—regulation of synthesis, 365, 1162
Arylsulfatase
—gene for, 140
Ascospores
—formation in *Nematospora coryli*, 927
—formation in *S. cerevisiae*, 869
—ultrastructure, 869, 927
Aspergillus nidulans
—branching of, 1097
—growth parameters for, 1097
Autolysin
—isolation of, 1258
—latent, 423
—of *B. subtilis*, 1247, 1258
—of *S. faecalis*, 423
Autolysis
—initiated by *p*-toluenethiol, 949
—in yeast, 949
Autotrophs
—growth on glucose, 1149
Azotobacter vinelandii
—ultrastructure of, 1191

Bacillus caldolyticus
—fatty acid composition of, 443
Bacillus caldotenax
—fatty acid composition of, 443
Bacillus cereus
—growth of, 1181
—outgrowth of spores, 599, 606
Bacillus licheniformis
—pyruvate carboxylase of, 764
Bacillus megaterium
—cell wall growth, 373
—NADH oxidase of, 51, 59
—ultrastructure of spores, 1198
Bacillus psychrophilus
—lysis at elevated temperature, 645
Bacillus stearothermophilus
—membranes of, 803, 811
—respiratory nitrate reductase of, 803
Bacillus subtilis
—accumulation of membrane inclusions by, 906
—asporogenous mutant, 1175
—autolysin-deficient mutant, 1247
—autolysins of, 1247, 1258
—cell wall of, 1247, 1266
—chromosomes of, 1075
—DNA synthesis, 379
—growth of, 1247
—nucleotides of, 1175
—phosphatidylethanolamine-deficient mutant, 939
—proteinase mutant, 575
—spores, 276
—sporulation of, 886
—tricarboxylic acid cycle mutants, 886
Bacteriophage 53
—transfection of *S. aureus*, 285
Bacteriophage 80α
—transfection of *S. aureus*, 285
Bacteriophage lambda
—receptor in *E. coli*, 1304
Bacteriophage φ80, 741
Bakers' yeast
—autolysis of, 949
Bdellovibrio
—polynucleotide homology among species, 209
—two new species of, 209
Bdellovibrio bacteriovorus
—nonidentity of strains 109D and 109J, 432
Blue-green algae
—fatty acid composition of, 827
Butyribacterium rettgeri
—acetate synthesis, 633

Canavanine
—yeast mutants resistant to, 1134
Candida scottii
—budding of, 922

Cardiolipin
—synthesis from phosphatidylglycerol, 820
Catabolite repression
—of actinomycin synthesis, 659
—of β-galactosidase synthesis, 391
cat gene
—deletions in, 790
Cell division
—at various temperatures, 848
—synchronized at high temperature, 1316
Cell membrane
—defective *S. typhimurium* mutant, 1273
—of *E. coli*, 471
—role in inhibition of adenosine triphosphatase, 471
—role in RNA synthesis, 218
Cell wall
—action of penicillin on synthesis, 1181
—growth of, 373
—interaction with concanavalin A, 652
—isolation of ends of rods, 1266
—of *B. megaterium*, 373
—of *B. subtilis*, 652, 1247, 1266
—of *E. coli*, 326, 686
—of *N. crassa* mutant, 933
—of *R. capsulata*, 1106
—synthesis in *B. cereus*, 1181
—synthesis in temperature-sensitive lysis mutants, 326
—temperature-mediated lysis of, 645
Cell wall composition
—in taxonomy studies, 1047
Chemolithotrophs
—growth on glucose, 1149
Chloramphenicol
—mechanism of resistance to, 1
Chromosomes
—of *B. subtilis*, 1075
—replication at various temperatures, 848
—structure and replication of, 1075
Clostridium
—triose phosphate isomerase of, 1325
Clostridium acidiurici
—acetate synthesis, 633
—formate dehydrogenase of, 152
—serine dehydratase of, 757
Clostridium botulinum
—spores of, 1295
Clostridium cylindrosporum
—acetate synthesis, 633
Clostridium formicoaceticum
—acetate synthesis, 626, 633
—fructose fermentation, 626
Clostridium perfringens
—spores of, 550
Clostridium taeniosporum
—spore appendages, 881
Clostridium thermoaceticum
—acetate synthesis, 633
Colicin D
—purification of, 12
Colicin E3, 12
Colicin Ia and Ib
—antigenic homology of, 1322
Competence
—suppression of, 560
Competence mutants
—fate of donor DNA in, 292
—responses to radiation, 298
Concanavalin A
—interaction with cell wall, 652
Coproporphyrin III, 409
Coryneforms, anaerobic
—cell wall composition, 1047
—DNA of, 1047
—relation to propionibacteria, 1047
Cycloheximide
—yeast mutants resistant to, 1134
D-Cycloserine
—in transformation of *Streptococcus*, 1014
Cysteine
—in *N. crassa*, 1001
Cytochromes
—of *B. megaterium* NADH oxidase, 59
—of respiration-deficient yeast, 409

3-Deoxy-D-*arabino*-heptulosonate 7-phosphate
—feedback regulation of, 1162
Deoxyribonuclease
—levels depending on culture age, 21
—of *Haemophilus*, 987
—of *M. gallisepticum*, 21
Deoxyribonucleic acid
—damage by mitomycins, 475
—degradation after antibiotic treatment, 250
—dependence of mesosomes upon, 1221
—effect of endodeoxyribonuclease on, 987
—effect of phenethyl alcohol on, 1170
—fate in competence mutants, 292
—G + C content in sulfate-reducing bacteria, 1191
—in transfection, 285
—in transformation, 266, 616, 844
—method for restricted labeling of, 599
—phenol-extracted, 844
—of *Anaplasma marginale*, 434
—of *E. coli*, 475, 953
—of *M. radiodurans*, 1310
—of *S. faecalis*, 1221
—of yeast, 979
—polynucleotide sequence divergence, 953
—ratio to protein content, 1310
—synthesis after irradiation, 379
—synthesis during outgrowth of spores, 606
—transforming, 292, 298
—UV-treated, 298, 379
—X-irradiated, 298, 379
Deoxyribonucleic acid homology
—among *Bdellovibrio* species, 209
—among compatible nocardiae, 720
—among *E. coli* strains, 953
—among "*Hydrogenomonas*" species, 465
—among marine vibrios, 696
—among propionibacteria and anaerobic coryneforms, 1047
Deoxyribonucleic acid polymerase I
—in *E. coli* mutants, 971

Diplococcus glycinophilus
—acetate synthesis, 633
Diplococcus pneumoniae
—thymidine-dependent mutants of, 459
—transformation events, 266

Emetine
—effect on trachoma agent synthesis, 966
Endodeoxyribonuclease
—of *Haemophilus*, 987
Escherichia coli
—adenosine triphosphatase of, 471
—alanine racemase levels, 1156
—alternate isoleucine synthesis pathway, 714
—cell division, 848, 1316
—cell membrane, 471, 686
—cell wall, 326, 686
—chloramphenicol resistance, 1
—DNA of, 475, 953
—DNA polymerase I of, 971
—drug resistance, 1, 1114
—effect of mitomycin on, 475
—effect of myxin on, 250
—effect of pressure on, 945
—F factor, 416, 447
—hybrid with *S. typhosa*, 1239
—in enteric environment, 74
—in germfree mice, 74
—mapping of *ilv* genes, 730
—metabolism of γ-aminobutyric acid, 835
—missense suppressor, 1125
—*ochre* suppressor, 1125
—"periplasmic leaky" mutants, 520
—phage lambda receptor, 1304
—phospholipid metabolism, 162, 1034
—plasmolysis, 229
—*rec* mutants, 971
—relationships among strains, 953
—repair of DNA damage, 475
—response to high sucrose concentration, 229
—R factors, 1, 1114
—ribosomes of, 1284
—RNA, 1284
—RNA synthesis during diauxie lag, 678
—sex factor, 416, 447, 1114
—sex pili, 1114
—sodium-sensitive mutant, 1034
—suppression of streptomycin dependence, 780
—synchronized cell division, 1316
—temperature dependence of sex factor, 447
—temperature-sensitive lysis mutant, 326
—thiamine pyrophosphate synthesis in, 936
—thymineless death, 462
—tRNA synthetases, 307, 315, 1020
—tryptophanase of, 74
—tryptophan regulatory mutants, 526
—ubiquinone-deficient mutants, 69, 134
—valyl-tRNA synthetase mutant, 307, 315
Exosporium
—of *B. megaterium* spore, 1198

F factor
—of *E. coli*, 416, 447
—of *S. typhimurium*, 741
—temperature dependence of, 447
Fatty acids
—configurations of, 186
—growth-supporting for yeast, 186
—of *B. caldolyticus*, 443
—of *B. caldotenax*, 443
—of blue-green algae, 827
—of *Hyphomicrobium*, 450
—of *Nitrobacter*, 450
—of T strain *Mycoplasma*, 565
Fixation
—of spores, 1295
Flagella
—proteolytic digestion of, 1239
—structure of, 1239
Flagellin, 1239
Formate dehydrogenase
—of *C. acidiurici*, 152
Fructose
—fermentation by *C. formicoaceticum*, 626

Galactose
—metabolism in *Streptococcus* strain Challis, 512
—pathway in *S. cerevisiae* mutant, 1139
β-Galactosidase
—release of synthesis from UV catabolite repression, 391
β-Galactosides
—transport of, 784
gal i locus
—in *S. cerevisiae*, 1139
Gene transfer
—inhibited by antiserum, 1067
Glucose
—transport of, 455
Glycine
—synthesis in yeast, 34
Guanine plus cytosine content
—of sulfate-reducing bacteria, 1298

Haemophilus
—endodeoxyribonuclease of, 987
Haemophilus influenzae
—suppression of competence, 560
Haemophilus vaginalis
—ultrastructure of, 930
Halobacterium cutirubrum
—malic enzyme of, 437
Hematin
—requirement for growth of *R. quintana*, 89
Homoserine-*O*-transsuccinylase
—regulation of, 8
Hydrogenomonas
—abandonment of genus, 465
—DNA homology among species, 465
Hydrogenomonas facilis
—3-phosphoglycerate kinase of, 751
Hydrostatic pressure
—effect on protein synthesis, 945
Hydroxylysine
—transport of, 179
Hyphomicrobium
—fatty acids of, 450

ICR-70, acridine mustard mutagen, 1134
ilv genes
—procedure for mapping, 730
Isoleucine
—synthesis in threonine dehydrataseless mutant, 714

β-Ketoadipate pathway
—control in *P. putida*, 790, 796
—enzymes of, 790, 796

lac gene
—fusion with *trp* gene, 526
Lactobacillus
—binding of vitamin B_{12}, 169
Laser
—use in size measurements of bacteria, 1301
Lipids
—distribution pattern in yeast, 186
—of *E. coli* cell wall and membrane, 686
—of T strain *Mycoplasma*, 565
Lipopolysaccharide
—of *R. capsulata*, 1106
Luciferase
—inhibition and activation of synthesis, 1101
Lysine
—transport of, 179
Lysis
—temperature-dependent, 645

Malic enzyme
—activation and stabilization by cations, 437
Maltose
—transport of, 455
Meiosis
—in ascospore formation, 869
Membrane inclusions
—in a mutant defective in lipid synthesis, 906
Membranes
—reconstitution of, 811
—solubilization of, 803
Merogenote
—derivation of, 741
—use in fine-structure mapping, 730
Mesosomes
—dependence on DNA synthesis, 1221
Methanobacillus omelianskii
—S organism isolated from, 539
Methanobacterium thermoautotrophicus sp. n., 707
Methionine
—synthesis of, 8
Methyl metabolism, 916
Methylotroph
—new organism, 916
Micrococcus
—halophilic amylase form, 570
Micrococcus radiodurans
—DNA-to-protein ratio, 1310
—radioresistance, 1310
Mitochondria
—development after anaerobic growth, 399
—insoluble proteins of, 855
Mitomycins
—effect on DNA, 475
Mucor genevensis
—mitochondria of, 399
Murein synthesis
—in temperature-sensitive lysis mutants, 326
Mycoplasma gallisepticum
—deoxyribonuclease of, 21
Mycoplasma, T strain
—lipids of, 565
Myxin
—lethality to *E. coli*, 250

Nematospora coryli
—ascosporogenesis, 927
Neurospora crassa
—amino acid transport mutant, 933
—cell wall of, 933
—cysteine content, 1001
—mi-1 strains of, 1001
—sulfur metabolism mutant, 140
—tryptophan content, 1001
Nicotinamide adenine dinucleotide
—of *B. megaterium*, 51, 59
—overproduction by mutants, 350
—separation of dehydrogenase and cytochromes. 59
Nitrate reductase
—of *B. stearothermophilus*, 803, 811
—solubilization of, 803
—reconstitution of, 811
Nitrobacter
—fatty acids of, 450
Nitrobacter agilis
—growth on glucose, 1149
Nitrosomonas europaea
—growth on glucose, 1149
Nocardia
—DNA homology among species, 720
Nuclear migration
—in *Schizophyllum*, 594
Nucleoid
—of *S. faecalis*, 1210
—response to inhibition of protein synthesis, 1210
Nucleotides
—levels during sporulation, 1175
Numerical taxonomy, 953

Orotidylic acid pyrophosphorylase
—of *S. cerevisiae*, 196
Osmosis
—mutant defective for, 1273
Oxidative phosphorylation
—in *S. agalactiae*, 96

Penicillin
—effect on cell wall synthesis, 1181
Penicillinase
—regulation in *S. aureus*, 116, 122
Penicillinase plasmid
—loss due to SDS, 262
—of *S. aureus*, 116
Peptidoglycan
—of a marine pseudomonad, 895

—of streptococci, 691
—ultrastructure of, 895
Periplasmic enzymes
—leakage of, 520
Phenethyl alcohol
—effect on membrane-attached DNA, 1170
—effect on phospholipid metabolism, 162
Phenoxazinone synthase
—catabolite repression by glucose, 659
Phosphatidylethanolamine
—effect of deficiency on transport, 939
Phosphoenolpyruvate carboxylase
—of *P. berghei*, 385
6-Phosphogluconate dehydrogenase
—NAD-linked, 106
Phosphoglycerate kinase
—of *H. facilis*, 751
Phospholipid
—altered metabolism in *E. coli* mutant, 1034
—deoxyglucose incorporation into, 81
—effect of phenethyl alcohol on metabolism, 162
—inositol-containing, 81
—metabolism by glycerol auxotroph, 668
—of *S. cerevisiae*, 81
Photoreactivation
—after UV catabolite repression, 391
—in *S. cerevisiae*, 1307
pi-Histidine factor
—integration of, 993
—of *S. typhimurium*, 993
Plasmodium berghei
—PEP carboxylase of, 385
Propionibacteria
—cell wall composition, 1047
—DNA of, 1047
—relation to anaerobic coryneforms, 1047
Proteinase
—mutant deficient in, 575
Protein synthesis
—dependence of RNA synthesis on, 773
—during outgrowth of spores, 606
—effect of pressure on, 945
Proteus mirabilis
—R factor of, 336, 492
Pseudomonas aeruginosa
—aromatic amino acid synthesis mutants, 365
Pseudomonas putida
—β-ketoadipate pathway of, 790, 796
Pseudomonas saccharophila
—ultrastructure of, 862
Pseudomonas schuylkilliensis
—RNA synthesis in, 218
Pseudomonas sp.
—peptidoglycan of, 895
Putrescine transcarbamoylase
—new enzyme of *S. faecalis*, 44
Pyrimidine dimers
—repair in yeast, 979
Pyrimidine pathway
—in *S. cerevisiae*, 196, 203
—regulation, 196
—regulatory mutants of *S. typhimurium*, 1085
Pyruvate carboxylase
—of *B. licheniformis*, 764

R factor
—F-like, 416
—for chloramphenicol resistance, 1
—mechanism of, 1
—of *E. coli*, 1, 1114
—of *P. mirabilis*, 336, 492
—of *V. cholerae*, 440
—replication of, 336, 492
Radioactive labeling
—label restricted to DNA only, 599
rec mutants
—DNA polymerase I of, 971
Rhizobium
—enzymes of, 467
—fast- and slow-growing groups, 467
Rhodopseudomonas capsulata
—cell wall of, 1106
—lipopolysaccharide of, 1106
Rhodopseudomonas palustris
—ribosomal proteins of, 1319
Rhodotorula glutinis
—budding of, 922
Ribonucleic acid
—association with membranes, 1284
—dependence on protein synthesis, 773
—role of cytoplasmic membrane in synthesis of, 218
—synthesis after thermal stress, 243
—synthesis during diauxie lag, 678
Ribose
—utilization by *V. alcalescens*, 1144
Ribosomal proteins
—of *R. palustris*, 1319
—suppression of streptomycin dependence by, 780
—synthesis by spores, 276
Ribosomes
—of *E. coli*, 1284
—of *R. palustris*, 1319
—synthesis after thermal stress, 243
Rickettsia quintana
—growth of, 89
—hematin requirement, 89

S organism
—characteristics of, 539
Saccharomyces
—glycine biosynthesis, 34
—serine biosynthesis, 34
Saccharomyces cerevisiae
—aerobic-adapted, 236
—ascospore formation, 869
—cycloheximide-resistant mutants, 1134
—cytochromes of, 409
—genes of, 1307
—fatty acid desaturase mutants, 186
—inositol-containing phospholipids of, 81
—mitochondria of, 855
—mutants in *gal i* locus, 1139
—nitrogen assimilation in, 25
—orotidylic acid pyrophosphorylase of, 196
—photoreactivation in, 1307
—pyrimidine dimer repair, 979
—respiration-deficient mutant, 409
—RNA synthesis in, 773

—spores, 1232
—sporulation of, 1027
—sterols of, 236
—transport of *S*-adenosylmethionine, 499
—ureidosuccinic acid uptake, 203
Salmonella typhimurium
—F factor of, 741
—flagella of, 1239
—*his* transducing particle of, 741
—methionine synthesis mutants, 8
—osmotic-sensitive mutant, 1373
—"periplasmic leaky" mutants, 520
—pi-histidine factor of, 993
—pyrimidine pathway mutants, 1085
—regulation of histidyl-tRNA synthetase, 505
—temperature-sensitive leucyl-tRNA of, 584
Salmonella typhosa
—hybrid with *E. coli*, 1313
Schizophyllum
—nuclear migration in, 594
Schizosaccharomyces pombe
—temperature-sensitive mutants of, 484
Serine
—synthesis in yeast, 34
Serine dehydratase
—of *C. acidiurici*, 757
Sex factor
—of *E. coli*, 416, 447
—of *S. typhimurium*, 741
—temperature dependence of, 447
Sex pili
—derepression of synthesis, 416
—role in SDS elimination of F and R factors, 1114
—serotypes of, 1067
Sodium dodecyl sulfate
—elimination of F and R factors, 1114
—plasmid-curing effect, 262
Spores
—alkali-treated, 550
—appendages of, 881
—DNA and protein synthesis in, 606
—fixation of, 1295
—germination of, 550, 1232
—heat-treated, 550
—of *B. cereus*, 599, 606
—of *B. megaterium*, 1198
—of *B. subtilis*, 276
—of *C. botulinum*, 1295
—of *C. perfringens*, 550
—of *C. taeniosporum*, 881
—of *S. cereviseae*, 1232
—outgrowth, 276, 599, 606, 1232
—synthesis of ribosomal proteins during outgrowth, 276
—ultrastructure of, 1198
Sporobolomyces salmonicolor
—budding of, 922
Sporulation
—dependence on cell cycle, 1027
—in *B. subtilis*, 886, 1175
—in *S. cerevisiae*, 1027
—in tricarboxylic acid cycle mutants, 886
—role of nucleotides in, 1175
Staphylococcus aureus
—cardiolipin synthesis, 820
—glycerol auxotroph of, 668
—penicillinase mutant, 116
—penicillinase plasmid, 262
—penicillinase synthesis, 122
—phospholipid metabolism, 668
—ribosome synthesis, 243
—transfection with phage DNA, 285
—transformation, 844
Staphylococcus epidermidis
—size distribution of, 1301
Sterols
—development during aerobic growth of yeast, 236
Streptococcus
—peptidoglycan composition, 691
—taxonomy of groups D, E, and H, 691
Streptococcus agalactiae
—glucose fermentation, 96
—oxidative phosphorylation in, 96
Streptococcus, Challis strain
—galactose metabolism in, 512
—loss of transformability, 616
—transformation of, 1014
Streptococcus faecalis
—agmatine fermentation by, 44
—autolytic-defective mutants, 423
—DNA synthesis in, 1221
—gluconate-adapted, 106
—hydroxylysine transport in, 179
—inhibition of protein synthesis, 1210
—lysine transport, 179
—mesosome growth in, 1221
—nucleoid morphology, 1210
—6-phosphogluconate dehydrogenase of, 106
Streptococcus lactis
—β-galactoside transport by, 784
Streptococcus mutans
—peptidoglycan composition, 691
Streptomyces antibioticus
—catabolite repression of actinomycin synthesis, 659
Streptomycin
—*E. coli* strain dependent on, 780
Succinate
—requirement for growth of *V. succinogenes*, 546
Sucrose
—effect of high concentrations on *E. coli*, 229
Sulfate-reducing bacteria
—G + C content of, 1298
Sulfur
—metabolism in *N. crassa*, 140
Suppressor mutations
—missense, 1125
—*ochre*, 1125

Taurine: α-ketoglutarate aminotransferase
—isolation of, 533
Thermoactinomyces vulgaris
—amylases of, 452
Thiamine pyrophosphate
—biosynthesis of, 936
Thiobacillus denitrificans
—growth on glucose, 1149

Thiobacillus neapolitanus
—growth on glucose, 1149
Thiobacillus thioparus
—growth on glucose, 1149
Thymidylate synthetase
—mutants deficient in, 459
Thymineless death
—nucleic acid and protein synthesis during, 462
p-Toluenethiol
—initiating autolysis, 949
Trachoma agent proteins, 966
Transfer ribonucleic acid synthetase
—histidyl-, 505
—leucyl-, 584
—methionyl-, 1020
—prolyl-, 1020
—threonyl-, 1020
—valyl-, 315
Transformation
—effect of heat on, 616
—in *Streptococcus*, 616
—of *D. pneumoniae*, 266
—mutants deficient for, 292
—with phenol-extracted DNA, 844
—with X-irradiated DNA, 298
Transport
—in phosphatidylethanolamine-deficient mutant, 939
—of amino acids, 933
—of β-galactosides, 784
—of glucose, 455
—of lysine, 179
—of maltose, 455
—of *S*-adenosylmethionine, 499
Treponema pallidum
—shape of, 943
Tricarboxylic acid cycle
—role in sporulation, 886
Triose phosphate isomerase
—of a psychrophilic *Clostridium*, 1325
trp gene
—fusion with *lac* gene, 526
Tryptophan
—in *N. crassa*, 1001
—regulatory system, 74, 526
Tryptophanase
—regulatory function in enteric environment, 74
Tryptophan, 5-methyl
—inducer of penicillinase synthesis, 122

Ubiquinone
—effects of deficiency on growth, 69
—gene for deficiency, 134
—synthesis, 134
Ultraviolet light
—catabolite repression by, 391
—effect on DNA, 298, 379
Ureidosuccinic acid
—uptake by *S. cerevisiae*, 203
Uridine diphosphate
—levels during sporulation, 1175

Valyl-transfer ribonucleic acid synthetase
—thermolabile, 307, 315
—relation to growth rate, 315
Veillonella alcalescens
—ribose utilization by, 1144
Vibrio alginolyticus
—relationship to other *Vibrio* strains, 696
Vibrio anguillarum
—relationship to other *Vibrio* strains, 696
Vibrio cholerae
—R factors of, 440
Vibrio MB22
—DAHP synthetase regulation in, 1162
Vibrio parahaemolyticus
—relationship to other *Vibrio* strains, 696
Vibrio succinogenes
—succinate requirement of, 546
Vitamin B_{12}
—binding by *Lactobacillus* cell wall, 169

X rays
—effect on DNA, 298, 379
—resistance to, 1310

JOURNAL

OF

BACTERIOLOGY

VOLUME 110

BALTIMORE, MD. 21202

1972

JOURNAL OF BACTERIOLOGY

VOLUME 110

EDITORIAL BOARD

L. LEON CAMPBELL, Editor-in-Chief (1975)
University of Illinois, Urbana

R. L. ANDERSON, Editor (1975)
Michigan State University, East Lansing

ROY CURTISS III, Editor (1974)
The University of Tennessee, Oak Ridge

S. G. BRADLEY, Editor (1974)
Virginia Commonwealth University, Richmond

ALLEN G. MARR, Editor (1973)
University of California, Davis

H. E. UMBARGER, Editor (1976)
Purdue University, Lafayette, Ind.

Martin Alexander (1972)
W. Lane Barksdale (1972)
M. E. Bayer (1972)
Claire M. Berg (1973)
Richard S. Berk (1974)
Robert W. Bernlohr (1973)
Allan Campbell (1972)
Wesley B. Catlin (1974)
A. J. Clark (1972)
D. Joseph Clark (1974)
Royston C. Clowes (1972)
V. W. Cochrane (1972)
Stanley N. Cohen (1973)
Ronald S. Cole (1974)
S. F. Conti (1972)
A. L. Demain (1972)
John A. DeMoss (1972)
Walter J. Dobrogosz (1973)
Martin Dworkin (1973)
R. G. Eagon (1974)
Alan D. Elbein (1973)
Wolfgang Epstein (1974)
Herman Friedman (1972)
A. T. Ganesan (1972)
Howard Goldfine (1972)
Joseph S. Gots (1972)
Harlyn O. Halvorson (1972)
F. M. Harold (1973)
Leonard Hayflick (1972)
George Hegeman (1974)
Charles E. Helmstetter (1972)
Robert K. Herman (1974)
Joseph T. Holden (1972)
John G. Holt (1972)
Stanley C. Holt (1974)
John Ingraham (1973)
Sam Kaplan (1974)
David E. Kennell (1974)
Hillel S. Levinson (1972)
W. R. Lockhart (1972)
Manley Mandel (1972)
David Mardon (1974)
Paul Margolin (1972)
Alvin Markovitz (1973)
M. L. Morse (1972)
Richard P. Novick (1973)
Leo Parks (1973)
H. J. Phaff (1972)
Allen T. Phillips (1973)
Jack Preiss (1974)
Charles C. Remsen III (1973)
William S. Reznikoff (1973)
H. V. Rickenberg (1973)
Antonio H. Romano (1973)
Harold L. Sadoff (1974)
M. R. J. Salton (1972)
Moselio Schaechter (1973)
David Schlessinger (1974)
Carl Schnaitman (1974)
Simon Silver (1973)
W. R. Sistrom (1972)
Lucile Smith (1972)
Bernard S. Strauss (1972)
Noboru Sueoka (1972)
Paul S. Sypherd (1974)
A. L. Taylor (1974)
Arthur Weissbach (1974)
N. E. Welker (1973)
R. W. Wheat (1972)
Helen R. Whiteley (1972)
Meyer J. Wolin (1973)
Frank E. Young (1973)
Stanley A. Zahler (1974)

ROBERT A. DAY, *Managing Editor, 1913 I St., N.W., Washington, D.C. 20006*

EX OFFICIO

MORRIS F. SHAFFER, President (1971–1972)
DONALD E. SHAY, Secretary

R. G. E. MURRAY, Vice-President (1971–1972)
T. J. CARSKI, Treasurer

The *Journal of Bacteriology*, a publication of the American Society for Microbiology, 1913 I St., N.W., Washington, D.C. 20006, is devoted to the advancement and dissemination of fundamental knowledge concerning bacteria and other microorganisms. The *Journal* is published monthly, and the twelve numbers are divided into four volumes per year. The subscription price is $52 (Postal Union Countries, $54; other foreign, $55) per year. Single copies are $5.00 (foreign, 5.25). Members of the American Society for Microbiology may receive the *Journal* as part of their dues. Correspondence relating to reprints, defective copies, availability of back issues, lost or late proofs, disposition of submitted manuscripts, and general editorial matters should be directed to the ASM Publications Office, 1913 I St., N.W., Washington, D.C. 20006. Correspondence from ASM members relating to membership dues, member subscriptions, changes of address, incorrect journals, etc., should be directed to the Executive Secretary, American Society for Microbiology, 1913 I St., N.W., Washington, D.C. 20006. Nonmembers of the Society should write to The Williams & Wilkins Co., 428 E. Preston St., Baltimore, Md. 21202, regarding institution of nonmember subscriptions and nonreceipt of journals. Published monthly by the ASM at 428 E. Preston St., Baltimore, Md. 21202.

Second class postage paid at Baltimore, Md. 21202, and at additional mailing offices.

Made in the United States of America.

Copyright © 1972, American Society for Microbiology
All Rights Reserved.

Volume 110

Contents for April

Number 1

Taxonomy and Ecology

Deoxyribonucleic Acid Homologies Among Some *Pseudomonas* Species. N. J. Palleroni, R. W. Ballard, Ericka Ralston, and M. Doudoroff 1
Deoxyribonucleic Acid Relatedness Among Species of *Erwinia* and Between *Erwinia* Species and Other Enterobacteria. Don J. Brenner, G. R. Fanning, and A. G. Steigerwalt 12
Production by *Aeromonas* of Common Enterobacterial Antigen and Its Possible Taxonomic Significance. H. Y. Whang, M. E. Heller, and E. Neter 161
Deoxyribonucleic Acid Base Sequence Homologies of Some Budding and Prosthecate Bacteria. Richard L. Moore and Peter Hirsch 256
Isolation and Characterization of Two Cell Types of *Coxiella burneti* Phase I. Michael E. Wiebe, Paul R. Burton, and Delbert M. Shankel 368
Taxonomy of Aerobic Marine Eubacteria. Linda Baumann, Paul Baumann, M. Mandel, and Richard D. Allen 402

Morphology and Ultrastructure

Biochemical Studies on the Thermal Dimorphism of *Paracoccidioides brasiliensis*. Fuminori Kanetsuna, Luis M. Carbonell, Ichiro Azuma, and Yuichi Yamamura 208
Structure and Chemical Composition of Prospheroplast Envelopes of *Saccharomyces cerevisiae* and *Hansenula anomala*. Sven Darling, Jørgen Theilade, and Aksel Birch-Andersen 336
Localization and Biological and Physicochemical Properties of the Cell Wall Lipopolysaccharide of *Rhodopseudomonas capsulata*. J. Weckesser, G. Drews, and R. Ladwig 346
Isolation and Characterization of *Microsporum gypseum* Lysosomes: Role of Lysosomes in Macroconidia Germination. W. J. Page and J. J. Stock 354
Effect of Growth Conditions on Morphology of *Hydrogenomonas facilis* and on Yield of a Phospholipoprotein. John Heptinstall, Harry G. Rittenhouse, Bruce A. McFadden, and Lewis K. Shumway 363
Dependence of the Rate of Synthesis of Phosphatidylethanolamine and Phosphatidylglycerol on the Rate of Growth of *Escherichia coli*. J. P. G. Ballesta and M. Schaechter 452

Genetics and Molecular Biology

Biochemical and Genetic Studies on Ubiquinone Biosynthesis in *Escherichia coli* K-12: 4-Hydroxybenzoate Octaprenyltransferase. I. G. Young, R. A. Leppik, J. A. Hamilton, and F. Gibson 18
Studies on *Escherichia coli* Enzymes Involved in the Synthesis of Uridine Diphosphate-*N*-Acetyl-Muramyl-Pentapeptide. E. J. J. Lugtenberg 26
Temperature-Sensitive Mutants of *Escherichia coli* K-12 with Low Activities of the L-Alanine Adding Enzyme and the D-Alanyl-D-Alanine Adding Enzyme. E. J. J. Lugtenberg and Arna van Schijndel-van Dam 35
Temperature-Sensitive Mutants of *Escherichia coli* K-12 with Low Activity of the Diaminopimelic Acid Adding Enzyme. E. J. J. Lugtenberg and Arna van Schijndel-van Dam 41
Mutagen Stability of Alkylation-Sensitive Mutants of *Bacillus subtilis*. T. Hill, L. Prakash, and B. Strauss 47
Induction of the *ara* Operon of *Escherichia coli* B/r. M. Ellin Doyle, Candice Brown, Robert W. Hogg, and Robert B. Helling 56
Structural Genes for Ornithine Transcarbamylase in *Salmonella typhimurium* and *Escherichia coli* K-12. J. Michael Syvanen and John R. Roth 66
Photoreactivation, Excision, and Strand-Rejoining Repair in R Factor-Containing Minicells of *Escherichia coli* K-12. M. C. Paterson and K. J. Roozen 71

Characterization of *S*-Adenosylmethionine:Ribosomal Ribonucleic Acid-Adenine (N^6-) Methyltransferase of *Escherichia coli* Strain B. JERRY E. SIPE, W. MARSHALL ANDERSON, JR., CHARLES N. REMY, AND SAMUEL H. LOVE 81
Control of the Pathway of γ-Aminobutyrate Breakdown in *Escherichia coli* K-12. SHABTAY DOVER AND YEHESKEL S. HALPERN 165
Construction and Properties of *Escherichia coli* Strains Exhibiting α-Complementation of β-Galactosidase Fragments In Vivo. PATRICE J. ZAMENHOF AND MERNA VILLAREJO 171
Stimulation of Unbalanced Ribonucleic Acid Synthesis in *Escherichia coli* by Methanol. GEORGE T. JAVOR 179
Manganese-Resistant Mutants of *Escherichia coli*: Physiological and Genetic Studies. SIMON SILVER, PAULA JOHNSEINE, ELEANOR WHITNEY, AND DAN CLARK 186
Biochemical and Genetic Characterization of β-Glucosidase Mutants in *Saccharomyces lactis*. MARJORIE TINGLE AND HARLYN O. HALVORSON 196
Conditional Dihydrostreptomycin Resistance in *Bacillus subtilis*. S. P. STAAL AND J. A. HOCH 202
Number of Deoxyribonucleic Acid Uptake Sites in Competent Cells of *Bacillus subtilis*. R. N. SINGH 266
Purification and Properties of Streptococcal Competence Factor Isolated from Chemically Defined Medium. C. GOMEZ LEONARD AND ROGER M. COLE 273
Regulation of the Bacterial Cell Wall: Analysis of a Mutant of *Bacillus subtilis* Defective in Biosynthesis of Teichoic Acid. R. J. BOYLAN, N. H. MENDELSON, D. BROOKS, AND F. E. YOUNG 281
Ribosomal Alterations Controlling Alkaline Phosphatase Isozymes in *Escherichia coli*. P. J. PIGGOT, M. D. SKLAR, AND L. GORINI 291
Comparative Chemistry of 30*S* Ribosomal Proteins of *Salmonella typhimurium*. JIUNN HUANG AND PAUL S. SYPHERD 300
Chromosomal Localization of the Structural Genes of the Polypeptide Chain Elongation Factors. JULIAN GORDON, L. S. BARON, AND MANFRED SCHWEIGER 306
Histidine Uptake in Strains of *Neurospora crassa* with Normal and Mutant Transport Systems. CLINT W. MAGILL, HUGH SWEENEY, AND V. W. WOODWARD 313
Membrane Mutation Associated with Sensitivity to Acriflavine in *Escherichia coli*. HAKOBU NAKAMURA AND ATSUSHI SUGANUMA 329
Aggregation of Deoxyribonucleic Acid and the Helping Effect in Transformation. ESTHER METZER AND ARNOLD W. RAVIN 454

Physiology and Metabolism

Relationship Between Age of Culture and Occurrence of the Pigments of Photosystem II of Photosynthesis in Heterocysts of a Blue-Green Alga. JOSEPH THOMAS 92
Control of Fatty Acid Synthesis in Bacteria. LEONARD MINDICH 96
Effect of Ammonia on the Synthesis and Function of the N_2-Fixing Enzyme System in *Clostridium pasteurianum*. GERALDINE DAESCH AND LEONARD E. MORTENSON 103
Identification of Products of the Uridinediphospho-*N*-Acetyl-D-Glucosamine Oxidoreductase System from *Citrobacter freundii* ATCC 10053. AMIRAM DANIEL, RUDOLF A. RAFF, AND ROBERT W. WHEAT 110
Cell Division of *Escherichia coli* BUG-6: Effect of Varying the Length of Growth at the Nonpermissive Temperature. JOHN N. REEVE AND D. JOSEPH CLARK 117
Cell Division of *Escherichia coli* BUG-6: Effect of Varying the Temperature Used as the Nonpermissive Growth Condition. JOHN N. REEVE AND D. JOSEPH CLARK ... 122
Ferredoxin- and Nicotinamide Adenine Dinucleotide-Dependent H_2 Production from Ethanol and Formate in Extracts of S Organism Isolated from "Methanobacillus omelianskii." C. ADINARAYANA REDDY, M. P. BRYANT, AND M. J. WOLIN 126
Ferredoxin-Dependent Conversion of Acetaldehyde to Acetate and H_2 in Extracts of S Organism. C. ADINARAYANA REDDY, M. P. BRYANT, AND M. J. WOLIN 133
Dihydrofolate Reductase Activity in Strains of *Streptococcus faecium* var. *durans* Resistant to Methasquin and Amethopterin. JEANNE I. RADER AND DORRIS J. HUTCHISON 139

Metabolism of Pyrimidines and Pyrimidine Nucleosides by *Salmonella typhimurium*. CHRISTOPH F. BECK, JOHN L. INGRAHAM, JAN NEUHARD, AND ELISABETH THOMASSEN 219
cis-Terpin Hydrate Metabolism by a Brevibacterium: Patterns of Enzyme Induction, and Accumulation of α-Terpineol in Growth Media. ROBERT H. BAUM AND ELEANOR K. MARR 229
Influence of Temperature on the Biosynthesis of Iron Transport Compounds by *Salmonella typhimurium*. J. A. GARIBALDI 262
Initiation of Spore Germination in Glycolytic Mutants of *Bacillus subtilis*. CHANDRAN PRASAD, MARTIN DIESTERHAFT, AND ERNST FREESE 321
Sporulation and Enterotoxin Production by Mutants of *Clostridium perfringens*. CHARLES L. DUNCAN, DOROTHY H. STRONG, AND MADELEINE SEBALD 378
Effect of Carbon Source on Size and Associated Properties of *Bacillus megaterium* Spores. A. D. HITCHINS, R. A. GREENE, AND R. A. SLEPECKY 392
Effects of Acridine Orange on the Growth of *Escherichia coli*. FREDERICK S. SOUTHWICK, HOWARD S. CARR, GEORGE A. CARDEN III, ROSE M. D'ALISA, AND HERBERT S. ROSENKRANZ 439
Ribosome Degradation and the Degradation Products in Starved *Escherichia coli*. V. Ribonucleoprotein Particles from Glucose-Starved Cells. HIROMI B. MARUYAMA AND SHOJI OKAMURA 442
Effects of Selenium Compounds on Formate Metabolism and Coincidence of Selenium-75 Incorporation and Formic Dehydrogenase Activity in Cell-Free Preparations of *Escherichia coli*. ARCHIE C. SHUM AND JOHN C. MURPHY 447
Specific Repression of Phosphoribosylpyrophosphate Synthetase by Uridine Compounds in *Salmonella typhimurium*. JOYCE OLSZOWY AND R. L. SWITZER 450

Enzymology

Inhibition of Tryptophan Synthetase by Indoleacrylic Acid. WILLIAM H. MATCHETT. 146
Glucose-6-Phosphate Dehydrogenase from *Escherichia coli* and from a "High-Level" Mutant. SANTIMOY BANERJEE AND D. G. FRAENKEL 155
Bacteriolytic Enzymes Produced by *Myxococcus xanthus*. SARA SUDO AND MARTIN DWORKIN 236
Purification and Characterization of Acid Phosphatase V from *Aspergillus nidulans*. ZSOLT HARSANYI AND GORDON L. DORN 246
Electron Transport Systems of *Nitrosomonas*: Isolation of a Membrane-Envelope Fraction. A. B. HOOPER, R. H. ERICKSON, AND K. R. TERRY 430

Volume 110

Contents for May

Number 2

Taxonomy and Ecology

Novel Anaerobic Cellulolytic Bacterium. J. M. LEATHERWOOD AND M. P. SHARMA 751
Clostridium barkeri sp. n. E. R. STADTMAN, THRESSA C. STADTMAN, IRA PASTAN, AND LOUIS DS. SMITH 758
Identification of Named Cultures of *Bacillus calidolactis* as *Bacillus stearothermophilus*. M. L. FIELDS AND O. HARRIS 772

Morphology and Ultrastructure

Isolation of Mycoplasma Membranes by Digitonin. SHLOMO ROTTEM AND SHMUEL RAZIN 699
Interaction of L Cells and *Chlamydia psittaci*: Entry of the Parasite and Host Responses to Its Development. ROBERT R. FRIIS 706
Detection of Cholesterol in Cell Membranes by Use of Bacterial Toxins. I. R. PENDLETON, K. S. KIM, AND A. W. BERNHEIMER 722

Kinetic and Morphological Observations on the Yeast Phase of *Histoplasma capsulatum* During Protoplast Formation. LUIS M. CARBONELL, MARTHA D. BERLINER, AND F. GIL ... 731
Golgi Apparatus in the Postmeiotic Basidium of *Coprinus lagopus*. DAVID J. McLAUGHLIN ... 739
Isolation of Morphological Mutants of *Agrobacterium tumefaciens*. TAMIO FUJIWARA AND SAKUZO FUKUI ... 743
Electron-Dense Particles Resembling Ribosomes in Mesosomes of *Bacillus subtilis*. A. MATHESON AND M. C. M. KWONG ... 747
Organization of Bacteriophage Tail-Like Particles in Cells of *Chromobacterium violaceum*. THOMAS E. RUCINSKY, JUDITH P. GREGORY, AND E. H. COTA-ROBLES ... 754
Lowered Respiratory Response to Adenosine Diphosphate of Mitochondria Isolated from a Mutant *B* Strain of *Schizophyllum commune*. ROBERT M. HOFFMAN AND JOHN R. RAPER ... 780

Genetics and Molecular Biology

Specific Inhibition of Cell Division by Colicin E_2 Without Degradation of Deoxyribonucleic Acid in a New Colicin Sensitivity Mutant of *Escherichia coli*. TERUHIKO BEPPU, KAZUO KAWABATA, AND KEI ARIMA ... 485
Conjugation in *Escherichia coli*: Failure to Confirm the Transfer of Part of Sex Factor at the Leading End of the Donor Chromosome. E. M. WALKER AND J. PITTARD ... 516
Properties of an R Factor Which Originated in *Pseudomonas aeruginosa* 1822. JOHN GRINSTED, J. R. SAUNDERS, LEWIS C. INGRAM, R. B. SYKES, AND M. H. RICHMOND ... 529
Regulation of Nitrate Reductase in *Neurospora crassa*: Stability In Vivo. K. N. SUBRAMANIAN AND G. J. SORGER ... 538
Regulation of Nitrate Reductase in *Neurospora crassa*: Regulation of Transcription and Translation. K. N. SUBRAMANIAN AND G. J. SORGER ... 547
Control of Nucleotide Metabolism and Ribosomal Ribonucleic Acid Synthesis During Nitrogen Starvation of *Escherichia coli*. JOSEPH D. IRR ... 554
Mutations in R Factors of *Escherichia coli* Causing an Increased Number of R-Factor Copies per Chromosome. KURT NORDSTRÖM, LEWIS C. INGRAM, AND ANNIKA LUNDBÄCK ... 562
Recombinant F′ Factors from *Escherichia coli* K-12 Strains Carrying *recB* or *recC*. J. D. HALL AND P. HOWARD-FLANDERS ... 578
Degree of Participation of Exogenous Thymidine in the Overall Deoxyribonucleic Acid Synthesis in *Escherichia coli*. DAPHNA ROSENBAUM-OLIVER AND STEPHEN ZAMENHOF ... 585
Physiological Factors in the Regulation of Alkaline Phosphatase Synthesis in *Escherichia coli*. ADAM S. WILKINS ... 616
Dissociation of Lac Messenger Ribonucleic Acid Transcription from Translation During Recovery from Inhibition of Protein Synthesis. MICHAEL ARTMAN AND HERBERT L. ENNIS ... 652
Comparison of Deoxyribonucleic Acid Uptake and Marker Integration in Bacilli and Protoplasts of *Bacillus subtilis*. IRVING L. MILLER, C. DWAYNE PALMER, AND OTTO E. LANDMAN ... 661
Nature of Col E_1 Plasmid Replication in *Escherichia coli* in the Presence of Chloramphenicol. DON B. CLEWELL ... 667
Changes in Ribonucleic Acid Turnover During Aerobic and Anaerobic Growth in *Rhodopseudomonas spheroides*. STEVEN S. WITKIN AND KENNETH D. GIBSON ... 677
Ribonucleic Acid from Aerobically and Anaerobically Grown *Rhodopseudomonas spheroides*: Comparison by Hybridization to Chromosomal and Satellite Deoxyribonucleic Acid. STEVEN S. WITKIN AND KENNETH D. GIBSON ... 684
Transformation in Group H Streptococci: Blackburn Strain Transformable Mutants. BOHDAN STAROŚCIAK, JANUSZ NAŁĘCZ, AND WŁADYSŁAW T. DOBRZAŃSKI ... 764
Isolation and Phenotypes of Mutants from *Salmonella typhimurium* Defective in Formate Hydrogenlyase Activity. M. CHIPPAUX, F. CASSE, AND M.-C. PASCAL ... 766

New Rifampin-Resistant Mutant of *Escherichia coli*. SERGIO MARSHALL AND DAVID GILLESPIE 782
Genetic Locus of a Gene Affecting Leucine Transport in *Salmonella typhimurium*. GRACE M. THORNE AND LAURENCE M. CORWIN 784
Demonstration of Two Cryptic Plasmids in *Salmonella pullorum* MS53. WILLIAM L. OLSEN AND D. E. SCHOENHARD 786
Mutation Affecting Plasmolysis in *Escherichia coli*. H. J. W. WIJSMAN 789

Physiology and Metabolism

Composition of Fatty Acids and Carbohydrates in *Leptospira*. EIKO KONDO AND NOBUO UETA 459
Influence of Magnesium and Manganese on Some Biological and Physical Properties of Tetracycline. DAVID SOMPOLINSKY AND ZEMIRA SAMRA 468
Differential Sensitivities of the Two Malate Dehydrogenases and the Maltose Permease to the Effect of Glucose in *Saccharomyces carlsbergensis*. J. VAN RIJN AND R. VAN WIJK 477
Effects of Chloramphenicol Isomers and Erythromycin on Enzyme and Lipid Synthesis Induced by Oxygen in Wild-Type and Petite Yeast. P. A. GORDON, M. J. LOWDON, AND P. R. STEWART 504
Effect of Unsaturated Fatty Acids on the Development of Respiration and on Protein Synthesis in an Unsaturated Fatty Acid Mutant of *Saccharomyces cerevisiae*. P. A. GORDON, M. J. LOWDON, AND P. R. STEWART 511
Osmotic Sensitivity in *Staphylococcus aureus* Induced by Streptomycin. PHILIP J. WYATT, RICHARD M. BERKMAN, AND DAVID T. PHILLIPS 523
Turnover of Putrescine in a *Pseudomonas* Species. RUTH MICHAELS AND T. T. TCHEN 592
Metabolism of Nicotinamide Adenine Dinucleotide in Human and Bovine Strains of *Mycobacterium tuberculosis*. LUKA B. KASĂROV AND ALBERT G. MOAT 600
Osmotic Stability and Sodium and Potassium Content of L-Forms of *Streptococcus faecalis*. J. Z. MONTGOMERIE, G. M. KALMANSON, E. G. HUBERT, AND L. B. GUZE 624
Mode of Action of Oxathiin Systemic Fungicides. V. Effect on Electron Transport System of *Ustilago maydis* and *Saccharomyces cerevisiae*. J. T. ULRICH AND D. E. MATHRE 628
Metabolism of Ethionine in Ethionine-Sensitive and Ethionine-Resistant Cells of the Enteric Yeast *Candida slooffii*. LEDA C. S. MENDONÇA AND LUIZ R. TRAVASSOS 643
Induction and Characterization of β-Galactosidase in an Extreme Thermophile. J. T. ULRICH, G. A. MCFETERS, AND K. L. TEMPLE 691
Isoleucine Accumulation by Regulatory Mutants of *Serratia marcescens*: Lack of Both Feedback Inhibition and Repression. MASAHIKO KISUMI, SABURO KOMATSUBARA, MASAKI SUGIURA, AND ICHIRO CHIBATA 761
Relationship Between Yield of Protoplasts and Growth Phase in *Saccharomyces*. M. M. SHAHIN 769
Sporulation and Heat Resistance of *Bacillus stearothermophilus* Spores Produced in Chemically Defined Media. ANSELMA DE GUZMAN, M. L. FIELDS, R. D. HUMBERT, AND NURIA KAZANAS 775
Effect of Temperature on the Respiration and Cytochromes of an Extreme Thermophile. GORDON A. MCFETERS AND J. TERRY ULRICH 777

Enzymology

Glutamate Dehydrogenase from *Mycoplasma laidlawii*. GERALD YARRISON, DIANE W. YOUNG, AND G. L. CHOULES 494
Physiological Studies of Methane- and Methanol-Oxidizing Bacteria: Comparison of a Primary Alcohol Dehydrogenase from *Methylococcus capsulatus* (Texas Strain) and *Pseudomonas* Species M27. R. N. PATEL, H. R. BOSE, W. J. MANDY, AND D. S. HOARE 570

Fructose-1,6-Diphosphate-Dependent Lactate Dehydrogenase from a Cariogenic *Streptococcus*: Purification and Regulatory Properties. ALBERT T. BROWN AND CHARLES L. WITTENBERGER 604
Ribulose Diphosphate Carboxylase from Autotrophic Microorganisms. BRUCE A. MCFADDEN AND ANITA R. DENEND 633

Volume 110 **Contents for June** **Number 3**

Taxonomy and Ecology

Enzyme Evolution in the *Enterobacteriaceae*. GARY T. COCKS AND ALLAN C. WILSON 793
Micro-Complement Fixation in *Klebsiella* Classification. DAVID L. STEFFEN, GARY T. COCKS, AND ALLAN C. WILSON 803
Predator-Prey Interactions of *Dictyostelium discoideum* and *Escherichia coli* in Continuous Culture. H. M. TSUCHIYA, J. F. DRAKE, J. L. JOST, AND A. G. FREDRICKSON. 1147

Morphology and Ultrastructure

Osmolar Concentration and Fixation of Mycoplasmas. RUTH M. LEMCKE 1154
Ultrastructure of Nematode-Trapping Fungi. C. E. HEINTZ AND DAVID PRAMER 1163

Genetics and Molecular Biology

Genetic Evidence for the Action of Oxathiin and Thiazole Derivatives on the Succinic Dehydrogenase System of *Ustilago maydis* Mitochondria. S. G. GEORGOPOULOS, E. ALEXANDRI, AND M. CHRYSAYI 809
Biosynthesis of Riboflavine in *Saccharomyces cerevisiae*: the Role of Genes rib_1 and rib_7. O. OLTMANNS AND A. BACHER 818
Protection of Normal, Lysogenic, and Pyocinogenic Strains Against Ultraviolet Radiation by Bound Acriflavine. TIKVAH ALPER, A. J. FORAGE, AND BRENDA HODGKINS 823
Conjugational Complementation Analysis of Transfer-Deficient Mutants of *Flac* in *Escherichia coli*. MARK ACHTMAN, NEIL WILLETTS, AND ALVIN J. CLARK 831
Genetic Analysis of Transfer by the *Escherichia coli* Sex Factor F, Using P1 Transductional Complementation. NEIL WILLETTS AND MARK ACHTMAN 843
Dependence of Cell Division on the Completion of Chromosome Replication in *Caulobacter crescentus*. SUZANNE T. DEGNEN AND AUSTIN NEWTON 852
Deletion Map of the *Escherichia coli* K-12 Sex Factor F: the Order of Eleven Transfer Cistrons. K. IPPEN-IHLER, M. ACHTMAN, AND N. WILLETTS 857
Effect of the Folic Acid Analogue, Trimethoprim, on Growth, Macromolecular Synthesis, and Incorporation of Exogenous Thymine in *Escherichia coli*. BEVERLY A. DALE AND G. ROBERT GREENBERG 905
Deoxyribonucleic Acid-Deoxyribonucleic Acid Hybridization Assay for Replication Origin Deoxyribonucleic Acid of *Escherichia coli*. PETER L. KUEMPEL 917
Gene Transfer in *Pasteurella pestis* Harboring the F'*Cm* Plasmid of *Escherichia coli*. WILLIAM D. LAWTON AND HAROLD B. STULL 926
Postreplication Repair of Ultraviolet Damage in *Haemophilus influenzae*. J. EUGENE LECLERC AND JANE K. SETLOW 930
Isolation and Characterization of a Phosphonomycin-Resistant Mutant of *Escherichia coli* K-12. P. S. VENKATESWARAN AND H. C. WU 935
Arginine Control of Transcription of *argECBH* Messenger Ribonucleic Acid in *Escherichia coli*. RICHARD KRZYZEK AND PALMER ROGERS 945
Repair of Ultraviolet Light-Induced Damage to the Deoxyribonucleic Acid of *Neurospora crassa*. THOMAS E. WORTHY AND J. L. EPLER 1010

Simple and Reliable Method for Replica Plating *Neurospora crassa*. R. K. Littlewood and K. D. Munkres 1017
Lytic Replication of Coliphage Lambda in *Salmonella typhosa* Hybrids. L. S. Baron, I. R. Ryman, E. M. Johnson, and P. Gemski, Jr. 1022
sai-1 Mutation in *Saccharomyces cerevisiae*: Characteristics of Inhibition by *S*-Adenosylmethionine and *S*-Adenosylhomocysteine and Protection by Methionine. Kemet D. Spence, Stanley K. Shapiro, and Nancy K. Hutson 1050
Isolation and Characterization of Ultraviolet Light-Sensitive Mutants of the Blue-Green Alga *Anacystis nidulans*. Yukio Asato 1058
Protein and Ribonucleic Acid Synthesis During the Diploid Life Cycle of *Allomyces arbuscula*. Daniel J. Burke, Thomas W. Seale, and Brian J. McCarthy 1065
Nonchromosomal Antibiotic Resistance in Bacteria. V. Isolation and Characterization of R Factor Mutants Exhibiting Temperature-Sensitive Repression of Fertility. Richard P. Silver and Stanley N. Cohen 1082
Multiple Regulator Gene Control of the Galoctose Operon in *Escherichia coli* K-12. Sui-Sheng Hua and Alvin Markovitz 1089
New Amino Acid Regulatory Locus Having Unusual Properties in Heterozygous Merodiploids. Ellis L. Kline 1127
Effect of Growth Conditions on the Formation of the Relaxation Complex of Supercoiled ColE1 Deoxyribonucleic Acid and Protein in *Escherichia coli*. Don B. Clewell and Donald R. Helinski 1135
Molecular Basis for the Transformation Defects in Mutants of *Haemophilus influenzae*. N. K. Notani, Jane K. Setlow, Vijaya R. Joshi, and D. P. Allison 1171
New Type of Ultraviolet Light-Sensitive Mutation in Yeast. Elizabeth M. Parry and James M. Parry 1206
Efficiency of Thymidine Incorporation in *Escherichia coli* B/r as a Function of Growth Rate. H. E. Kubitschek, D. Valdez, and M. L. Freedman 1208

Physiology and Metabolism

Mutant of *Escherichia coli* K-12 Deficient for Detergent-Resistant Phospholipase A. Misao Ohki, Osamu Doi, and Shoshichi Nojima 864
Regulation of Arginase Activity by Intermediates of the Arginine Biosynthetic Pathway in *Neurospora crassa*. J. Mora, R. Salceda, and S. Sanchez 870
Ribosome Maturation of *Escherichia coli* Growing at Different Growth Rates. George A. Michaels 889
Serine Biosynthesis and Its Regulation in *Bacillus subtilis*. Manuel M. Ponce-de-Leon and Lewis I. Pizer 895
Heterotrophic Nitrification by *Arthrobacter* sp. W. Verstraete and M. Alexander 955
Mechanism of Nitrification by *Arthrobacter* sp. W. Verstraete and M. Alexander 962
Development of a Membrane-Bound Respiratory System Prior to and During Sporulation in *Bacillus cereus* and Its Relationship to Membrane Structure. Dennis R. Lang, J. Felix, and D. G. Lundgren 968
Effects of Molybdate, Tungstate, and Selenium Compounds on Formate Dehydrogenase and Other Enzyme Systems in *Escherichia coli*. Harry G. Enoch and Robert L. Lester 1032
Regulation of Exocellular Proteases in *Neurospora crassa*: Induction and Repression of Enzyme Synthesis. H. Drucker 1041
Regulation of Valine Catabolism in *Pseudomonas putida*. Vincent dePaul Marshall and John R. Sokatch 1073
Effects of Fatty Acid Substitution on the Release of Enzymes by Osmotic Shock. Barry P. Rosen and S. Lynette Hackette 1181
Yeast Membrane Vesicles: Isolation and General Characteristics. Michael S. Christensen and Vincent P. Cirillo 1190

Enzymology

N-Acetylmuramyl-L-Alanine Amidase of *Bacillus licheniformis* and Its L-Form. C. W. FORSBERG AND J. B. WARD 878
Mechanism of D-Cycloserine Action: Alanine Racemase from *Escherichia coli* W. MARY P. LAMBERT AND FRANCIS C. NEUHAUS 978
Correlation Between Hydrolysis of the β-Lactam Bond of the Cephalosporin Nucleus and Expulsion of the 3-Substituent. CYNTHIA H. O'CALLAGHAN, SUSAN M. KIRBY, A. MORRIS, R. E. WALLER, AND R. E. DUNCOMBE 988
Extracellular Alkaline Amylase from a *Bacillus* Species. E. W. BOYER AND M. B. INGLE 992
Purification and Partial Characterization of a Bacteriocin from *Serratia marcescens*. JOHN FOULDS 1001
Tryptophan Synthetase in *Euglena gracilis* Strain G. J. CANO LARA AND S. E. MILLS .. 1100
Multiple Forms of *Pseudomonas multivorans* Glucose-6-Phosphate and 6-Phosphogluconate Dehydrogenases: Differences in Size, Pyridine Nucleotide Specificity, and Susceptibility to Inhibition by Adenosine 5′-Triphosphate. T. G. LESSIE AND J. C. VANDER WYK 1107
α-Isopropylmalate Synthase from Yeast: Purification, Kinetic Studies, and Effect of Ligands on Stability. E. H. ULM, R. BÖHME, AND G. KOHLHAW 1118
Four-Iron (Sulfide) Ferredoxin from *Bacillus polymyxa*. DUANE C. YOCH AND RAYMOND C. VALENTINE 1211

AUTHOR INDEX

VOLUME 110

Achtman, Mark, 831, 843, 857
Alexander, M., 955, 962
Alexandri, E., 809
Allen, Richard D., 402
Allison, D. P., 1171
Alper, Tikvah, 823
Anderson, W. Marshall, Jr., 81
Arima, Kei, 485
Artman, Michael, 652
Asato, Yukio, 1058
Azuma, Ichiro, 208

Bacher, A., 818
Ballard, R. W., 1
Ballesta, J. P. G., 452
Banerjee, Santimoy, 155
Baron, L. S., 306, 1022
Baum, Robert H., 229
Baumann, Linda, 402
Baumann, Paul 402
Beck, Christoph F., 219
Beppu, Teruhiko, 485
Berkman, Richard M., 523
Berliner, Martha D., 731
Bernheimer, A. W., 722
Birch-Andersen, Aksel, 336
Böhme, R., 1118
Bose, H. R., 570
Boyer, E. W., 992
Boylan, R. J., 281
Brenner, Don J., 12
Brooks, D., 281
Brown, Albert T., 604
Brown, Candice, 56
Bryant, M. P., 126, 133
Burke, Daniel J., 1065
Burton, Paul R., 368

Carbonell, Luis M., 208, 731
Carden, George A. III, 439
Carr, Howard S., 439
Casse, F., 766
Chibata, Ichiro, 761
Chippaux, M., 766
Choules, G. L., 494
Christensen, Michael S., 1190
Chrysayi, M., 809
Cirillo, Vincent P., 1190
Clark, Alvin J., 831
Clark, Dan, 186
Clark, D. Joseph, 117, 122
Clewell, Don B., 667, 1135
Cocks, Gary T., 793, 803
Cohen, Stanley N., 1082
Cole, Roger M., 273
Corwin, Laurence M., 784
Cota-Robles, E. H., 754

Daesch, Geraldine, 103
Dale, Beverly A., 905
D'Alisa, Rose M., 439
Daniel, Amiram, 110
Darling, Sven, 336
Degnen, Suzanne T., 852
de Guzman, Anselma, 775
Denend, Anita R., 633
Diesterhaft, Martin, 321
Dobrzański, Wladyslaw T., 764
Doi, Osamu, 864
Dorn, Gordon L., 246
Doudoroff, M., 1
Dover, Shabtay, 165
Doyle, M. Ellin, 56
Drake, J. F., 1147
Drews, G., 346
Drucker, H., 1041
Duncan, Charles L., 378
Duncombe, R. E., 988
Dworkin, Martin, 236

Ennis, Herbert L., 652
Enoch, Harry G., 1032
Epler, J. L., 1010
Erickson, R. H., 430

Fanning, G. R., 12
Felix, J., 968
Fields, M. L., 772, 775
Forage, A. J., 823
Forsberg, C. W., 878
Foulds, John, 1001
Fraenkel, D. G., 155
Frederickson, A. G., 1147
Freedman, M. L., 1208
Freese, Ernst, 321
Friis, Robert R., 706
Fujiwara, Tamio, 743
Fukui, Sakuzo, 743

Garibaldi, J. A., 262
Gemski, P., Jr., 1022
Georgopoulos, S. G., 809
Gibson, F., 18
Gibson, Kenneth D., 677, 684
Gil, Francisco, 731
Gillespie, David, 782
Gordon, Julian, 306
Gordon, P. A., 504, 511
Gorini, L., 291
Greenberg, G. Robert, 905
Greene, R. A., 392
Gregory, Judith P., 754
Grinsted, John, 529
Guze, L. B., 624

Hackette, S. Lynette, 1181
Hall, J. D., 578
Halpern, Yeheskel S., 165
Halvorson, Harlyn O., 196
Hamilton, J. A., 18
Harris, O., 772
Harsanyi, Zsolt, 246
Heintz, C. E., 1163
Helinski, Donald R., 1135
Heller, M. E., 161
Helling, Robert B., 56
Heptinstall, John, 363
Hill, T., 47
Hirsch, Peter, 256
Hitchins, A. D., 392
Hoare, D. S., 570
Hoch, J. A., 202
Hodgkins, Brenda, 823
Hoffman, Robert, 780
Hogg, Robert W., 56
Hooper, A. B., 430
Howard-Flanders, P., 578
Hua, Sui-Sheng, 1089
Huang, Jiunn, 300
Hubert, E. G., 624
Humbert, R. D., 775
Hutchison, Dorris J., 139
Hutson, Nancy K., 1050

Ingle, M. B., 992
Ingraham, John L., 219
Ingram, Lewis C., 529, 562
Ippen-Ihler, K., 857
Irr, Joseph D., 554

Javor, George T., 179
Johnseine, Paula, 186
Johnson, E. M., 1022
Joshi, Vijaya R., 1171
Jost, J. L., 1147

Kalmanson, G. M., 624
Kanetsuna, Fuminori, 208
Kasárov. Luka B., 600
Kawabata, Kazuo, 485
Kazanas, Nuria, 775
Kim, K. S., 722
Kirby, Susan M., 988
Kisumi, Masahiko, 761
Kline, Ellis L., 1127
Kohlhaw, G., 1118
Komatsubara, Saburo, 761
Kondo, Eiko, 459
Krzyzek, Richard, 945
Kubitschek, H. E., 1208
Kuempel, Peter L., 917
Kwong, M. C. M., 747

Ladwig, R., 346
Lambert, Mary P., 978
Landman, Otto E., 661
Lang, Dennis R., 968
Lara, J. Cano, 1100
Lawton, William D., 926
Leatherwood, J. M., 751
Leclerc, J. Eugene, 930
Lemcke, Ruth M., 1154
Leonard, C. Gomez, 273
Leppik, R. A., 18
Lessie, T. G., 1107
Lester, Robert L., 1032
Littlewood, R. K., 1017
Love, Samuel H., 81
Lowdon, M. J., 504, 511
Lugtenberg, E. J. J., 26, 35, 41
Lundbäck, Annika, 562
Lundgren, D. G., 968

McCarthy, Brian, J., 1065
McFadden, Bruce A., 363, 633
McFeters, Gordon A., 691, 777
McLaughlin, David J., 739
Magill, Clint W., 313
Mandel, M., 402
Mandy, W. J., 570
Markovitz, Alvin, 1089
Marr, Eleanor K., 229
Marshall, Sergio, 782
Marshall, Vincent dePaul, 1073
Maruyama, Hiromi B., 442
Matchett, William H., 146
Matheson, A., 747
Mathre, D. E., 628
Mendelson, N. H., 281
Mendonça, Leda C. S., 643
Metzer, Esther, 454
Michaels, George A., 889
Michaels, Ruth, 592
Miller, Irving L., 661
Mills, S. E., 1100
Mindich, Leonard, 96
Moat, Albert G., 600
Montgomerie, J. Z., 624
Moore, Richard L., 256
Mora, J., 870
Morris, A., 988
Mortenson, Leonard E., 103
Munkres, K. D., 1017
Murphy, John C., 447

Nałęcz, Janusz, 764
Nakamura, Hakobu, 329
Neter, E., 161
Neuhard, Jan, 219
Neuhaus, Francis C., 978
Newton, Austin, 852
Nojima, Shoshichi, 864
Nordström, Kurt, 562
Notani, N. K., 1171

O'Callaghan, Cynthia H., 988
Ohki, Misao, 864
Okamura, Shoji, 442
Olsen, William L., 786
Olszowy, Joyce, 450
Oltmanns, O., 818

Page, W. J., 354
Palleroni, N. J., 1
Palmer, C. Dwayne, 661
Parry, Elizabeth M., 1206
Parry, James M., 1206
Pascal, M.-C., 766
Pastan, Ira, 758
Patel, R. N., 570
Paterson, M. C., 71
Pendleton, I. R., 722
Phillips, David T., 523
Piggot, P. J., 291
Pittard, J., 516
Pizer, Lewis I., 895
Ponce-de-Leon, Manuel M., 895
Prakash, L., 47
Pramer, David, 1163
Prasad, Chandan, 321

Rader, Jeanne I., 139
Raff, Rudolf A., 110
Ralston, Ericka, 1
Raper, John R., 780
Ravin, Arnold W., 454
Razin, Shmuel, 699
Reddy, C. Adinarayana, 126, 133
Reeve, John N., 117, 122
Remy, Charles N., 81
Richmond, M. H., 529
Rittenhouse, Harry G., 363
Rogers, Palmer, 945
Roozen, K. J., 71
Rosen, Barry P., 1181
Rosenbaum-Oliver, Daphna, 585
Rosenkranz, Herbert S., 439
Roth, John R., 66
Rottem, Shlomo, 699
Rucinsky, Thomas E., 754
Ryman, I. R., 1022

Salceda, R., 870
Samra, Zemira, 468
Sanchez, S., 870
Saunders, J. R., 529
Schaechter, M., 452
Schoenhard, D. E., 786
Schweiger, Manfred, 306
Seale, Thomas W., 1065
Sebald, Madeleine, 378
Setlow, Jane K., 930, 1171
Shahin, M. M., 769
Shankel, Delbert M., 368
Shapiro, Stanley K., 1050

Sharma, M. P., 751
Shum, Archie C., 447
Shumway, Lewis K., 363
Silver, Richard P., 1082
Silver, Simon, 186
Singh, R. N., 266
Sipe, Jerry E., 81
Sklar, M. D., 291
Slepecky, R. A., 392
Smith, Louis DS., 758
Sokatch, John R., 1073
Sompolinsky, David, 468
Sorger, G. J., 538, 547
Southwick, Frederick S., 439
Spence, Kemet D., 1050
Staal, S. P., 202
Stadtman, E. R., 758
Stadtman, Thressa C., 758
Starościak, Bohdan, 764
Steffen, David L., 803
Steigerwalt, A. G., 12
Stewart, P. R., 504, 511
Stock, J. J., 354
Strauss, B., 47
Strong, Dorothy H., 378
Stull, Harold B., 926
Subramanian, K. N., 538, 547
Sudo, Sara, 236
Suganuma, Atsushi, 329
Sugiura, Masaki, 761
Sweeney, Hugh, 313
Switzer, R. L., 450
Sykes, R. B., 529
Sypherd, Paul S., 300
Syvanen, J. Michael, 66

Tchen, T. T., 592
Temple, K. L., 691
Terry, K. R., 430
Theilade, Jørgen, 336
Thomas, Joseph, 92
Thomassen, Elisabeth, 219
Thorne, Grace M., 784
Tingle, Marjorie, 196
Travassos, Luiz R., 643
Tsuchiya, H. M., 1147

Ueta, Nobuo, 459
Ulm, E. H., 1118
Ulrich, J. T., 628, 691, 777

Valdez, D., 1208
Valentine, Raymond C., 1211
Vander Wyk, J. C., 1107
van Rijn, J., 477
van Schijndel-van Dam, Arna, 35, 41
van Wijk, R., 477
Venkateswaran, P. S., 935
Verstraete, W., 955, 962
Villarejo, Merna, 171

Walker, E. M., 516
Waller, R. E., 988
Ward, J. B., 878
Weckesser, J., 346
Whang, H. Y., 161
Wheat, Robert W., 110
Whitney, Eleanor, 186
Wiebe, Michael E., 368
Wijsman, H. J., 789
Wilkins, Adam S., 616
Willetts, Neil, 831, 843, 857
Wilson, Allan C., 793, 803
Witkin, Steven S., 677, 684
Wittenberger, Charles L., 604
Wolin, M. J., 126, 133
Woodward, V. W., 313
Worthy, Thomas E., 1010
Wu, H. C., 935
Wyatt, Philip J., 523
Yamamura, Yuichi, 208
Yarrison, Gerald, 494
Yoch, Duane C., 1211
Young, Diane W., 494
Young, F. E., 281
Young, I. G., 18
Zamenhof, Patrice J., 171
Zamenhof, Stephen, 585

SUBJECT INDEX

VOLUME 110

Acetate
— production by S organism, 133
N-Acetymuramyl-L-alanine amidase
— *B. licheniformis*, 878
Acholeplasma laidlawii
— membrane cholesterol, 722
— osmolar effects on fixation, 1154
Acid phosphatase
— *A. nidulans*, 246
— purification and properties, 246
Acridine orange
— DNA degradation by, 439
Acriflavine
— protection against UV, 823
— sensitivity to, 329
Adenosine triphosphatase
— of membrane vesicles, 1190
S-Adenosylhomocysteine
— inhibition of yeast, 1050
S-Adenosylmethionine
— inhibition of yeast, 1050
S-Adenosylmethionine:ribosomal ribonucleic acid-adenine (N^6-) methyltransferase
— isolation and characterization, 81
Aerobacter aerogenes
— relation to *Klebsiella*, 803
Aeromonas
— common enterobacterial antigen production, 161
Agrobacterium tumefaciens
— morphological mutants, 743
L-Alanine
— adding enzyme, 35
Alanine racemase
— inhibition by D-cycloserine, 978
D-Alanyl-D-alanine
— adding enzyme, 35
Alcaligenes
— marine species, 402
Alcohol dehydrogenase
— *Methylococcus capsulatus*, 570
— *Pseudomonas* sp. M27, 570
Alkaline amylase
— isolation, properties, and products, 992
Alkaline phosphatase
— *E. coli*, 291, 616, 793
— *Enterobacteriaceae*, 793
— induction, 616
— interspecific relatedness studies, 793
— isozymes, 291
—*Klebsiella* and related species, 803
Allomyces arbuscula
— protein and RNA synthesis, 1065
Alteromonas
— new genus, 402
Amethopterin
— resistance to, 139
D-Amino acid dehydrogenase, 1073
Amino acid transport
— permease systems, 313
γ-Aminobutyrate
— catabolism control, 165
γ-Aminobutyrate-α-ketoglutarate transaminase
— synthesis control, 165
Amino sugars
— synthesis, 110
Anabaena
— photosystem II pigments, 92
Anacystis nidulans
— UV-sensitive mutant, 1058
ara
— induction of, 56
Arabinose
— *ara* induction by, 56
argECBH
— transcription of, 945
argI
— isolation of, 66
Arginase
— inhibition of, 870
Arginine
— control of transcription of *argECBH* mRNA, 945
— synthesis in *N. crassa*, 870
Arthrobacter sp.
— nitrification by, 955, 962
Arthrobotrys dactyloides
— ultrastructure, 1163
Aspergillus nidulans
— acid phosphatase V, 246

Bacillus
— alkaline amylase, 992
Bacillus calidolactis
— identification as *B. stearothermophilus*, 772
Bacillus cereus
— electron transport system, 968
Bacillus licheniformis
— amidase, 878
Bacillus megaterium
— spore size and composition, 392
Bacillus polymyxa
— ferredoxin, 1211
Bacillus stearothermophilus
— *B. calidolactis* identity with, 772
— sporulation, 775
Bacillus subtilis
— competent, 266
— DNA polymerase, 47
— DNA uptake, 661
— DNA uptake sites, 266
— fatty acid synthesis, 96
— mesosomes, 747
— mutagen-stable, 47

— protoplasts, 661, 747
— Rod mutant, 281
— serine synthesis and regulation, 895
— streptomycin resistance genes, 202
— techoic acid synthesis, 281
Bacteriocin
— *S. marcescens*, 1001
Bacteriolytic enzymes
— *Myxococcus xanthus*, 236
Bacteriophage
— susceptibility to, 857
— tail-like particles in *Chromobacterium violaceum*, 754
— transduction, 843
Bacteriophage lambda
— lytic replication, 1022
Basidium
— *C. lagopus*, 731
— golgi apparatus of, 731
Blue-green algae
— pigments of, 92
Bovine serum albumin
— growth on, 1041
Branched-chain keto acid dehydrogenase, 1073
Brevibacterium
— *cis*-terpin hydrate metabolism, 229

Candida sloofii
— ethionine sensitivity, 643
Carboxin
— electron transport inhibition, 628
Caulobacter crescentus
— chromosome replication and cell division, 852
Cell division
— *Caulobacter crescentus*, 852
— chloramphenicol effects, 117, 122
— inhibition by colicin E_2, 485
— model for, 117, 122
— temperature-sensitive, 117, 122
Cell membrane
— *A. laidlawii*, 722
— amidase of, 878
— cholesterol detection, 722
— damage to and RNA synthesis, 179
— electron transport system, 430
— isolation by digitonin, 699
— *M. gallisepticum*, 722
— *M. hominis*, 699
— *Nitrosomonas*, 430
Cell wall
— *B. subtilis*, 281
— *E. coli*, 452
— lipopolysaccharide, 346
— *P. brasiliensis*, 208
— phosphatidylethanolamine synthesis, 452
— phosphatidylglycerol synthesis, 452
— *R. capsulata*, 346
— teichoid acid-defective, 281
Cephalosporins
— hydrolysis by β-lactamases, 988
Chlamydia psittaci
— infection of L cells, 706
Chloramphenicol
— mitochondrial enzyme inhibition by, 504
Cholesterol
— detection in membranes, 722
Chromobacterium violaceum
— bacteriophage tail-like particles, 754
Chromosome
— replication and cell division, 852
Citrobacter freundii
— UDPGlcNAc oxidoreductase system, 110
Citrulline
— in arginine synthesis, 870
Clostridium barkeri sp. n., 758
Clostridium pasteurianum
— N_2-fixing enzyme system, 103
Clostridium perfringens
— enterotoxin production and sporulation, 378
Col E_1 plasmid
— relaxation complex, 1135
— replication, 667, 1135
Colicin E_2
— cell division inhibition by, 485
Common enterobacterial antigen, 161
Competence factor
— streptococcal, 273, 764
α-Complementation
— of β-galactosidase fragments, 171
Complementation analysis, 831, 843, 857
Conjugation
— of transfer-deficient mutants, 831, 843
— transfer of sex factor, 516
Coprinus lagopus
— golgi apparatus, 739
Coxiella burneti
— morphological types, 368
D-Cycloserine
— alanine racemase inhibition, 978
Cytochromes
— extreme thermophile, 777
— *Nitrosomonas*, 430
— sporulating *B. cereus*, 968
Cytosine
— metabolism in *S. typhimurium*, 219

Dactylella drechslerii
— ultrastructure, 1163
Deoxyribonucleic acid
— acridine orange sensitivity, 439
— acriflavine protection against UV, 823
— *B. subtilis*, 661
— *Caulobacter crescentus*, 852
— Col E_1, 667, 1135
— colicin E_2 effect on, 485
— conjugational transfer, 843
— *E. coli*, 439, 585, 823, 917
— excision repair, 71, 1010
— *H. influenzae*, 930
— postreplication repair, 930
— photoreactivation, 71, 1010, 1058
— replication and cell division, 852
— replication origin, 917
— R factor, 71
— strand-rejoining, 71
— synthesis inhibition, 905
— thymidine incorporation, degree of participation, 585

— thymidine incorporation rates, 1208
— transformation-defective, 1171
— transforming, 266, 454
— uptake by protoplasts, 661
— uptake sites, 266
Deoxyribonucleic acid homology
— *Erwinia*, 12
— prosthecate bacteria, 256
— *Pseudomonas* species, 1
Deoxyribonucleic acid polymerase
— mutagen-stable, 47
Diaminopimelic acid
— adding enzyme, 41
Dictyostelium discoideum
— predation on *E. coli*, 1147
Digitonin
— membrane isolation by, 699
Dihydrofolate reductase
— *S. faecium* var. *durans*, 139
Dihydrostreptomycin
— resistance to, 202

Electron transport
— inhibition by oxathiin (carboxin), 628
— isolation of *Nitrosomonas* system, 430
— *S. cerevisiae*, 628
— sporulating *B. cereus*, 968
— *U. maydis*, 628
Endopeptidase
— *Myxococcus xanthus*, 236
Enterobacter
— enzyme evolution, 793
Enterobacter aerogenes
— relation to *Klebsiella*, 803
Enterobacteriaceae
— common antigen, 161
— enzyme evolution, 793
Enterotoxin
— *C. perfringens*, 378
Erwinia
— DNA homology, 12
— enzyme evolution, 793
— relatedness to other enterobacteria, 12
Erythromycin
— mitochondrial enzyme inhibition by, 504
Escherichia coli
— acridine orange sensitivity, 439
— acriflavine protection against UV, 823
— acriflavine sensitivity, 329
— alanine racemase inhibition, 978
— alkaline phosphatase synthesis, 291, 616
— *ara* operon induction, 56
— *argECBH* mRNA transcription, 945
— *capR*, *capS*, *capT* genes, 1089
— cell division, 117, 122
— Col E_1 plasmid, 667, 1135
— colicin sensitivity mutant, 485
— conjugation, 516, 831, 843
— DNA homology with *Erwinia*, 12
— DNA synthesis, 585
— elaidate-grown, 1181
— evolution of enzymes, 793
— F′ factor recombination, 578
— *Flac* deletion map, 857
— *Flac* mutants, 831, 843
— fluoroleucine resistance locus, 1127
— formate dehydrogenase, 447, 1032
— GABA breakdown, 165
— β-galactosidase α-complementation, 171
— *gal* operon, 1089
— glucose-6-phophate dehydrogenase, 155
— hybrid with *S. typhosa*, 1022
— Lac mRNA, 652
— leucine operon expression, 1127
— manganese resistance, 186
— minicells, 71
— molybdate effects on, 1032
— murein synthesis, 26, 35, 41
— murein synthesis genes, 35
— nitrogen starvation, 554
— oleate-grown, 1181
— ornithine transcarbamylase genes, 66
— osmotic shock of, 1181
— phosphatidylethanolamine synthesis, 452
— phosphatidylglycerol synthesis, 452
— phospholipase A-less mutant, 864
— phosphonomycin-resistant mutant, 935
— plasma membrane, 329
— plasmolysis mutation, 789
— polypeptide chain elongation factor gene, 306
— predation by *Dictyostelium discoideum*, 1147
— R factor, 562
— *recB*, *recC*, 578
— replication origin DNA, 917
— ribosome assembly, 889
— ribosome degradation, 442
— rifampin-resistant mutant, 782
— RNA synthesis, 179
— rRNA methylation, 81
— rRNA synthesis, 554
— selenium requirement, 447, 1032
— tetracycline accumulation, 468
— sex factor transfer, 516
— thymidine incorporation, 585, 1208
— *tra* gene, 831, 843, 857
— transduction by P1, 843
— transfer-deficient mutants, 831, 843
— trimethoprim effect on, 905
— tungstate effects on, 1032
— ubiquinone synthesis, 18
— Z gene, 171
Ethanol
— metabolism by S organism, 126
Ethionine
— sensitivity in *Candida sloofii*, 643
Euglena gracilis
— tryptophan synthetase, 1100
Excision repair
— *E. coli* minicells, 71
— *N. crassa*, 1010

F factor
— deletion map of, 857
— fertility repression by R factor, 1082
F′ factor
— recombinant, 578

Fatty acids
— *B. subtilis*, 96
— leptospiral, 459
— synthesis by yeast fatty acid mutant, 511
— synthesis control, 96
F′ *Cm* plasmid
— transfer by *P. pestis*, 926
Ferredoxin
— *B. polymyxa*, 1211
— S organism, 126, 133
Ferritin-labeling
— cholesterol detection, 722
Fixation techniques
— role of osmolar concentration, 1154
Flac mutants
— conjugational complementation analysis, 831
— tranductional complementation analysis, 843
— transfer-deficient, 831, 843
Formate
— metabolism by S organism, 126
Formate dehydrogenase
— molybdate, tungstate, and selenium effects on, 1032
— selenium requirement, 447
Formate hydrogenlyase
— *S. typhimurium* defective mutant, 766

Galactose
— regulator genes, 1089
β-Galactosidase
— α-complementation, 171
— thermophilic, 691
Germination
— *Allomyces*, 1065
— *B. subtilis* spores, 321
— initiating agents, 321
— *M. gypseum* macroconidia, 354
— protein and RNA synthesis during, 1065
Glucans
— *P. brasiliensis* cell wall, 208
Glucosaminidase
— *Myxococcus xanthus*, 236
Glucose
— metabolism by spores, 321
Glucose-6-phosphate dehydrogenase
— inhibition by ATP, 1107
— purification from mutant *E. coli*, 155
— pyridine nucleotide specificity, 1107
β-Glucosidase
— *Saccharomyces lactis* mutant, 196
Glutamate dehydrogenase
— *M. laidlawii*, 494
Glycolysis
— regulation, 604
Golgi apparatus
— of *Coprinus lagopus* basidium, 739

Haemophilus influenzae
— repair of UV-damaged DNA, 930
— transformation defects, 1171
Hansenula anomala
— prospheroplast envelope, 336
Histidine
— uptake system, 313
Histoplasma capsulatum
— protoplast formation, 731
Hydrogenomonas facilis
— morphological variations, 363
— phospholipoprotein, 363
4-Hydroxybenzoate octaprenyltransferase
— gene for, 18
3-Hydroxyisobutyrate dehydrogenase, 1073
Hydroxylamine, 955, 962
Hyphomicrobium
— genetic relatedness studies, 256

Indoleacrylic acid
— inhibition of *N. crassa* tryptophan synthetase, 146
Invertase
— of membrane vesicles, 1190
Iron transport compounds
— temperature-sensitive synthesis, 262
Isoleucine
— accumulation by regulatory mutants, 761
α-Isopropylmalate synthase
— purification and properties, 1118

Klebsiella
— alkaline phosphatase, 793, 803
— enzyme evolution, 793
Klebsiella pneumoniae
— DNA homology with *Erwinia*, 12

L cells
— *C. psittaci* infection, 706
lac
— mRNA transcription and translation, 652
β-Lactamases
— cephalosporin hydrolysis by, 988
β-Lactam ring
— hydrolysis of, 988
Lactate dehydrogenase
— fructose-1,6-P-dependent, 604
— streptococcal, 604
Leptospira
— fatty acid and monosaccharide composition, 459
Leucine
— operon expression, 1127
— synthesis, 1127
— transport gene, 784
L-form
— *B. licheniformis*, 878
— osmotic stability, 624
— *S. faecalis*, 624
Lysosomes
— macroconidial germination role, 354
Lytic enzyme
— of *B. licheniformis* cell membrane, 878

Macroconidia
— germination, 354
Magnesium
— tetracycline chelation, 468

Malate dehydrogenase
— glucose sensitivity, 477
Maltose permease
— glucose sensitivity, 477
Manganese
— resistance to, 186
— tetracycline chelation, 468
Marine bacteria, aerobic
— taxonomy, 402
Membranes
— electron transport systems, 968
— vesicle isolation and properties, 1190
Mesosomes
— *B. subtilis*, 747
— ribosome-like particles in, 747
Messenger ribonucleic acid
— control of transcription, 945
— *lac*-specific, 652
— transcription and translation, 652
"Methanobacillus omelianskii"
— S organism, 126, 133
Methanol
— cell membrane damage, 179
— stimulation of RNA synthesis, 179
Methasquin
— resistance to, 139
Methionine
— inhibition reversal in yeast, 1050
Methylmalonate semialdehyde dehydrogenase, 1073
Methyl methanesulfonate
— sensitivity to, 47
Methylococcus capsulatus
— primary alcohol dehydrogenase, 570
Methyltransferase
— rRNA, 81
Microsporum gypseum
— lysosomes, 354
— macroconidial germination, 354
Minicells
—DNA repair, 71
Mitochondria
— fatty acid influence on enzyme synthesis, 511
— inhibition of enzyme synthesis, 504
— *S. cerevisiae*, 504, 1190
— *S. commune B* strain mutant, 780
— *U. maydis*, 809
Mitosporangium
— RNA and protein synthesis during formation, 1065
Molybdate
— metabolic effects on *E. coli*, 1032
Monacrosporium rutgeriensis
— ultrastructure, 1163
Monosaccharides
—leptospiral, 459
Murein synthesis
— enzymes of, 26, 35, 41
— genes, 35
Mutagenesis
— resistance to, 47
Mycobacterium tuberculosis
— NAD metabolism, 600
— human and bovine strains compared, 600
Mycoplasma
— osmolar effects on fixation of, 1154
Mycoplasma gallisepticum
— membrane cholesterol, 722
Mycoplasma hominis
— cell membrane isolation, 699
Mycoplasma laidlawii
— glutamate dehydrogenase, 494
Myxococcus xanthus
— bacteriolytic enzymes, 236

Nematode-trapping fungi
— ultrastructure, 1163
Neurospora crassa
— arginine pathway, 870
— DNA repair, 1010
— histidine uptake, 313
— inhibition by indoleacrylic acid, 146
— nitrate reductase, 538, 547
— protease synthesis, 1041
— replica-plating method, 1017
— tryptophan synthetase, 146
Nicotinamide adenine dinucleotide
— H_2 production from, 126
— metabolism, 600
Nitrate reductase
— *N. crassa*, 538, 547
— stability, 538
—transcription and translation, 547
Nitrification
— *Arthrobacter* sp., 955, 962
— heterotrophic, 955
— mechanism of, 962
Nitrogen fixation
— enzyme system, 103
— *C. pasteurianum*, 103
Nitrosomonas
— electron transport system isolation, 430

Ornithine
— arginase inhibitor, 870
Ornithine transcarbamylase
— genes for, 66
Osmolarity
— effect on fixation of mycoplasmas, 1154
Osmotic sensitivity
— *S. aureus*, 523
— streptomycin-induced, 523
Osmotic shock
— enzyme release due to, 1181
Osmotic stability
— *S. faecalis* L-forms, 624
Oxathiin
— *S. cerevisiae* inhibition, 628
— *U. maydis* inhibition, 628, 809

Palmitic acid
— *Leptospira*, 459
Paracoccidioides brasiliensis
— cell wall components, 208
— thermal dimorphism, 208
Pasteurella pestis
— gene transfer, 926
Pasteurella pseudotuberculosis
— gene transfer, 926

Phage susceptibility
— of transfer-deficient mutants, 857
Phagocytosis
— of *C. psittaci* by L cells, 706
Phosphatidylethanolamine
— synthesis rate, 452
Phosphatidylglycerol
— synthesis rate, 452
6-Phosphogluconate dehydrogenases
— pyridine nucleotide specificity, 1107
Phospholipase A
— detergent-resistant, 864
— mutant lacking, 864
Phospholipid
— synthesis control, 96
Phospholipoprotein
— *H. facilis*, 363
Phosphonomycin
— resistance to in *E. coli*, 935
Phosphoribosylpyrophosphate synthetase
— repression by uridine, 450
Phosphorylated pathway
— serine synthesis, 895
Photoreactivation
— *A. nidulans* mutant, 1058
— *E. coli* minicells, 71
— *N. crassa*, 1010
Photosystem II
— *Anabaena*, 92
Phycocyanins
— *Anabaena*, 92
Phycoerythrin
— *Anabaena*, 92
Plasma membrane
— acriflavine sensitivity, 329
Plasmolysis
— temperature-sensitive mutant, 789
Polypeptide chain elongation factor
— gene location, 306
Predation
— Lotka-Volterra model, 1147
— Monod model, 1147
Prospheroplast envelope
— *S. cerevisiae*, 336
— *H. anomala*, 336
Prosthecate bacteria
— genetic relatedness, 256
Protease
— *Myxococcus xanthus*, 236
— *N. crassa*, 1041
— synthesis induction and repression, 1041
Proteus
— enzyme evolution, 793
Proteus mirabilis
— polypeptide chain elongation factor gene, 306
— R factor, 562
Protoplasts
— *B. subtilis*, 661
— DNA uptake by, 661
— formation, 731
— *Histoplasma capsulatum*, 731
— *Saccharomyces*, 769
Pseudomonas
— DNA homology groups, 1
— marine species, 402
Pseudomonas sp.
— putrescine metabolism, 592
Pseudomonas sp. M27
— primary alcohol dehydrogenase, 570
Pseudomonas aeruginosa
— R factor, 529
Pseudomonas multivorans
— glucose-6-phosphate dehydrogenases, 1107
— 6-phosphogluconate dehydrogenases, 1107
Pseudomonas putida
— valine catabolism, 1073
Putrescine
— metabolism by *Pseudomonas* sp., 592
Pyrimidine nucleosides
— metabolism of, 219
Pyrimidines
— metabolism of, 219

R factor
— fertility repression by, 1082
— gene dosage effect, 562
— mutant, 562
— *P. aeruginosa*, 529
— repair, 71
— temperature-sensitive repressor substance of, 1082
Recombination
— F′ factor, 578
— protoplast, 661
Replica-plating
— method for *N. crassa*, 1017
Respiration
— *S. commune B* strain mutant, 780
Rhodopseudomonas capsulata
— cell wall lipopolysaccharide, 346
Rhodopseudomonas spheroides
— aerobic and anaerobic growth, 677, 684
— RNA, 677, 684
Riboflavine
— synthesis in *S. cerevisiae*, 818
Ribonucleic acid
— *R. spheroides*, 677, 684
— synthesis control, 179, 554
— synthesis during aerobic and anaerobic growth, 677, 684
— synthesis during *Allomyces* life cycle, 1065
— synthesis inhibition, 905
— unbalanced synthesis, 179
Ribonucleic acid control gene, 554
Ribonucleic acid polymerase
— *E. coli* mutant, 782
Ribosomal ribonucleic acid
— methylation of, 81
— synthesis during nitrogen starvation, 554
Ribosomes
— assembly of, 889
— degradation of, 442
— *E. coli*, 889
— mesosomal, 747
Ribulose diphosphate carboxylase
— *Thiobacillus denitrificans*, 633
Rifampin
— *E. coli* resistant mutant, 782

Rumen
— novel bacterium of, 751

Saccharomyces
— protoplast formation, 769
Saccharomyces calsbergensis
— malate dehydrogenase, 477
— maltose permease, 477
Saccharomyces cerevisiae
— electron transport inhibition, 628
— fatty acid mutant, 511
— inhibition by *S*-adenosylmethionine and *S*-adenosylhomocysteine, 1050
— membrane vesicles, 1190
— mitochondrial enzymes 504, 511
— oxathiin effects, 628
— prospheroplast envelope, 336
— riboflavine synthesis, 818
— *sai-1* mutation, 1050
— temperature-sensitive *rad* mutations, 1206
— UV sensitivity genes, 1206
Saccharomyces lactis
— β-glucosidase mutant, 196
Salmonella pullorum
— cryptic plasmids, 786
Salmonella typhimurium
— formate hydrogenlyase mutant, 766
— iron transport compounds, 262
— leucine transport gene, 784
— ornithine transcarbamylase gene, 66
— phosphoribosylpyrophosphate synthetase repression, 450
— pyrimidine metabolism, 219
— temperature-sensitive growth, 262
Salmonella typhosa
— hybrid with *E. coli*, 1022
— phage sensitivity, 1022
Schizophyllum commune
— mitochondria of *B* strain mutant, 780
Selenium
— metabolic effects on *E. coli*, 1032
— requirement for formate metabolism, 447, 1032
Serine
— synthesis in *B. subtilis*, 895
Serratia marcescens
— bacteriocin, 1001
— isoleucine accumulation, 761
Sex factor
— transfer, 516
Sodium dodecyl sulfate
— phospholipase resistant to, 864
S organism
— acetate production, 133
— growth, 126
— H_2 production, 126, 133
Spores
— *B. megaterium*, 392
— *B. subtilis*, 321
— germination initiating agents, 321
— glucose metabolism, 321
Sporulation
— *B. cereus*, 968
— *B. stearothermophilus*, 775
— *B. subtilis*, 202
— *C. perfringens*, 378
— electron transport during, 968
— medium for, 775
— streptomycin sensitivity, 202
Staphylococcus aureus
— osmotic sensitivity, 523
— tetracycline accumulation, 468
Streptococcus, Challis strain
— competence factor, 273
Streptococcus, Blackburn strain
— transformable mutants, 764
Streptococcus faecalis
— L-forms, 624
— osmotic stability 624
Streptococcus faecium var. *durans*
— dihydrofolate reductase, 139
Streptococcus mutans
— lactate dehydrogenase, 604
Streptomycin
— osmotic sensitivity induced by, 523
— resistance genes, 202
Succinic semialdehyde dehydrogenase
— synthesis control, 165
Succinic dehydrogenase
— *U. maydis*, 809

Techoic acid
— defective synthesis, 281
cis-Terpin hydrate
— metabolism system, 229
Tetracycline
— magnesium and manganese effects on, 468
Thermophile
— respiration, 777
— β-galactosidase of, 691
Thermus aquaticus
— thermophile resembling, 691, 777
Thiazole
— action on *U. maydis* succinic dehydrogenase, 809
Thiobacillus denitrificans
— ribulose diphosphate carboxylase, 633
Thymidine
— degree of participation in DNA synthesis, 585
— incorporation rates, 1208
Thymine
— trimethoprim effect on incorporation, 905
tra
— cistrons, 831, 843
— order of cistrons, 857
Transcription
— *argECBH* mRNA, 945
Transduction
— of transfer-deficient mutants, 843
Transfer-deficient mutants
— conjugational complementation analysis of, 831
— *Flac*, 857
— transductional complementation analysis of, 843
Transformation
— Blackburn strain streptococcus, 764
— defective, 1171
— helping effect, 454

Trimethoprim
— effect on thymine incorporation, 905
Tryptophan synthetase
— *E. gracilis*, 1100
— inhibition by indoleacrylic acid, 146
— *N. crassa*, 146
Tungstate
— metabolic effects on *E. coli*, 1032

Ubiquinone
— gene for, 18
— synthetic enzymes, 18
Ultraviolet radiation
— acriflavine protection against, 823
— *A. nidulans* mutant sensitive to, 1058
— prophage induction by, 823
— pyocin induction by, 823
— repair of DNA damaged by, 930, 1010
— yeast sensitivity genes, 1206
Uracil
— metabolism in *S. typhimurium*, 219
Uridine
— repression of phosphoribosylpyrophosphate synthetase, 450
Uridine diphosphate-*N*-acetylmuramyl-pentapeptide
— synthesis, 26, 35, 41
Uridinediphospho-*N*-acetyl-D-glucosamine oxidoreductase
— products, 110
Ustilago maydis
— electron transport inhibition, 628
— oxathiin effects, 628, 809
— succinic dehydrogenase system, 809

Valine
— catabolism enzymes, 1073

INDEX TO DATE OF ISSUE

Month	Date of Issue	Pages
April	17 April 1972	1–458
May	10 May 1972	459–792
June	14 June 1972	793–1214